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Evaluating Performance of Portuguese Marine Spatial Planning

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Ao meu país salgado

Previous page: watercolour by the author inspired in a line drawing by Carlos de Bragança (1863-1908), Portuguese artist, naturalist, oceanographer, and king

“There are no passengers on spaceship Earth. We are all crew.”

Marshall McLuhan (1911-1980)

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"*No (wo)man is an island*"

(Adapted from John Donne, 1572-1631)

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EVALUATING PERFORMANCE OF PORTUGUESE MARINE SPATIAL PLANNING

MARIA ADELAIDE DE OLIVEIRA FERREIRA

ABSTRACT

KEYWORDS: MSP performance, indicators, evaluation, Portugal, participatory process

Marine spatial planning (MSP), a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives, is today generally accepted as the preferred tool to promote sustainable development of our increasingly degrading marine environment. However, as implementation of MSP grows worldwide, so does the realisation of the importance of effectively assessing performance of that implementation, to ensure that MSP delivers its maximum potential. While some evaluation initiatives are already in place, dedicated research on the evaluation component of MSP is a pressing need.

Portugal is one of Europe's and the world's largest maritime nations, and, in line with EU policy and guidelines, has just completed its legal framework for MSP. As the spatial plan for the c. 4 M km^2 of Portugal's national maritime space (NMS) is being developed, it is critical that it is coupled from the onset with the discussion on how its performance (the success of those actions) will be evaluated. This study aimed to assist the emerging Portuguese MSP system, in the development of an evaluation mechanism to assess its performance, based on a set of national, strategic level indicators scoped out through a participatory approach.

The methodology used was based on a combination of secondary research (literature review) and primary research (data production). The latter included two components both involving MSP stakeholders: i) an analysis of the Portuguese legal framework for MSP; ii) the development of an indicator system to evaluate MSP performance designed as a five-step iterative process and based on legally stated objectives of MSP.

A framework for evaluating performance of Portuguese MSP is proposed. Indicators selected are related to the EU's eleven principles for MSP and the legally stated objectives of Portuguese MSP. They cover key aspects of MSP: the ecosystem-approach to management, data and knowledge base, transparency, stakeholder participation, improved coordination, legal certainty, and articulation at the boundaries of MSP (land-sea integration, and cross-border cooperation).

This research constituted a first approach to a mechanism to evaluate MSP performance for the entire Portuguese NMS from the outset of the planning process. It was unique in Portugal in fully engaging a diversity of MSP practitioners and stakeholders in this stage of planning evaluation, a burgeoning approach at the international level. As such, while the proposed mechanism was focused on the Portuguese case, it has the potential to be useful, relevant and adaptable to other coastal nations in Europe and beyond.

AVALIAÇÃO DO DESEMPENHO DO ORDENAMENTO DO ESPAÇO MARÍTIMO PORTUGUÊS

MARIA ADELAIDE DE OLIVEIRA FERREIRA

RESUMO

PALAVRAS-CHAVE: Desempenho do OEM, indicadores, avaliação, Portugal, processo participado

O Ordenamento do Espaço Marítimo (OEM), um processo público de analisar e alocar a distribuição especial e temporal das actividades humanas em áreas marinhas para alcançar objectivos ecológicos, económicos e sociais, é hoje globalmente aceite como a ferramenta preferencial para promover o desenvolvimento sustentável do nosso ambiente marinho, em crescente estado de degradação. Porém, à medida que a implementação do OEM aumenta a nível mundial, também cresce a consciência da importância de uma avaliação concreta dessa implementação, de forma a assegurar que o desempenho do OEM maximiza o seu potencial. Embora algumas iniciativas de avaliação estejam já em curso, há uma necessidade premente de desenvolver investigação dedicada sobre a componente de avaliação em OEM.

Portugal é uma das maiores nações marítimas da União Europeia (UE) e do mundo e, em linha com as políticas e directrizes da UE, acabou de completar o seu quadro legal para o OEM. Enquanto o plano de situação para os c. de 4 M km^2 do espaço marítimo nacional (EMN) está a ser desenvolvido, é crítico que, desde o início, ele seja acompanhado por uma discussão de como o seu desempenho (o sucesso das acções efectuadas no seu âmbito) será avaliado. Este estudo pretendeu contribuir para o OEM português, através da proposta de um mecanismo de avaliação para avaliar o seu desempenho, baseado num conjunto de indicadores nacionais de nível estratégico.

A metodologia usada foi baseada numa combinação de fontes secundárias (revisão bibliográfica) e primárias (produção de dados), esta última envolvendo agentes de OEM: i) uma análise do quadro legal português de OEM; ii) o desenvolvimento de um sistema de indicadores para avaliar o desempenho do OEM nacional, concebido como um processo iterativo, com cinco passos, e baseado nos objectivos de OEM legalmente estabelecidos. Os indicadores seleccionados estão relacionados com os onze princípios da UE para o OEM e com os objectivos de OEM português legalmente estabelecidos, e cobrem aspectos chave do OEM: abordagem ecossistémica, base de informação, transparência, participação dos agentes, melhorias na coordenação, segurança legal e articulação nas fronteiras do OEM (integração mar-terra e cooperação transfronteiriça).

Este estudo constituiu uma primeira abordagem a um mecanismo de avaliação do desempenho do OEM em todo o EMN, desde o arranque do processo de planeamento. Tratou-se de uma abordagem única em Portugal no que diz respeito ao envolvimento de um conjunto alargado de agentes nesta fase do planeamento da avaliação em OEM, uma metodologia que inicia a sua implementação ao nível internacional. Assim, embora o mecanismo proposto tenha sido focado no caso português, tem o potential de ser útil, relevante e adaptável a outras nações costeiras europeias e no resto do mundo.

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List of acronyms

CBA – Cost-Benefit Analysis

CBD – Convention on Biological Diversity

CLCS – Commission on the Limits of the Continental Shelf

CMSP – Coastal and Marine Spatial Planning

DGPM – Portugal's General-Directorate for Maritime Policy

EAP – EU's Environmental Action Program

EBM – Ecosystem-based management

EC – European Commission

EEA – European Environment Agency

EEZ – Exclusive Economic Zone

EIA – Environmental Impact Assessment

EU – European Union

EUSDS – European Union Sustainable Development Strategy

FCSH/UNL – *Faculdade de Ciências Sociais e Humanas/Universidade Nova de Lisboa*

FCT – Foundation for Science and Technology

GDP – Gross Domestic Product

GES – Good Environmental Status

GIS – Geographic Information System

GS – Good status

ICM – Integrated Coastal Management

ICZM – Integrated Coastal Zone Management

IMP – EU's Integrated Maritime Policy

IOOO – Input-Output-Outcome-Outreach

IWCO – Independent World Commission on the Oceans

LOSC – Law of the Sea Convention

MPA – Marine Protected Area

MRE – Marine Renewable Energy

MSFD – EU's Marine Strategy Framework Directive

MSP – Marine Spatial Planning

MSPlans – Marine Spatial Plans

MSPM – Marine Spatial Planning and Management

NGO – Non-Governmental Organization

NM – Nautical mile

NMS – National Maritime Space

NOP – National Ocean Policy

NOS – National Ocean Strategy

POEM – *Plano de Ordenamento do Espaço Marítimo*

R&D – Research and Development

SD – Sustainable Development

SDG – UN's Sustainable Development Goal

SEA – Strategic Environmental Assessment

SMART – Specific, Measurable, Achievable, Relevant, Time-bound

TUEM – *Taxa de utilização do EMN* (private use feee)

U.S. – United States

UK – United Kingdom

UN – United Nations

UNCLOS – United Nations Convention on the Law of the Sea

UNEP – United Nations Environment Programme

UNESCO – United Nations Educational, Scientific and Cultural Organization

WFD – EU's Water Framework Directive

Foreword

1972, the year when I was born, marked some type of global awakening to the increasing environmental deterioration of our home, this "mote of dust suspended in a sunbeam". I grew up listening about the hole in the ozone layer, about climate change and a poisoned environment – I remember looking out the window worrying if some or how much radiation from Chernobyl was upon us, hoping it would be just too far away.

Born and bred in Portugal, and the daughter of a sailor, the sea was a constant in my life. I knew, since the age of 8, the two things I wanted to be when I grew up: a mother, and a scientist. Further inspired by Jacques-Yves Cousteau, whose documentaries I religiously watched every Sunday morning on TV, a more specific focus on saltwater environments was soon decided upon…

Now, at 44, I am a mother (of a wonderful 12-year old girl) and a scientist of sorts (biologist, ecologist, environmental activist), primarily focused on coastal environments, and more recently, with some added grasp of geography and planning, on the marine environment. My broad goals (and some more specific objectives) charted as a child for my future self, were broadly reached. In performance evaluation, this would undoubtedly equate to success. But implementation continues…

Part of the deal of being a mother and a scientist of sorts is the responsibility to actively contribute to promote a safe operating space for humanity – one that will allow my daughter to grow up happy and healthy in a healthy planet, where her children, and all children, now, then, and after, can grow happy and healthy too. Our daily options in everything we do are nothing more than the management measures that will lead us closer or further away from that objective – and time is of the essence.

This thesis offers a humble yet hopeful contribution to inform Portuguese MSP as it progresses towards implementation – so that 30-50 years from now those who are still around may conclude that Portuguese MSP contributed to reach the broad goal of sustainable development of our marine environment on this planet Ocean.

Lagos, 16 November 2016

Introduction

La mer
Qu'on voit danser
Le long des golfes clairs
A des reflets d'argent
La mer
Des reflets changeants
Sous la pluie

La mer
Les a bercés
Le long des golfes clairs
Et d'une chanson d'amour
La mer
A bercé mon cœur pour la vie

Charles Trenet (1946)

Introduction

A need to advance performance evaluation of Marine Spatial Planning

The ocean is increasingly viewed as the last frontier (Norse, 2007). As resources dwindle on land, attentions turn to the maritime realm as a renewed source of opportunities for growth. One notable example is the European Commission's Blue Growth strategy, listing opportunities for marine and maritime sustainable growth (EC, 2012). However, as human activities gradually encroach on the ocean, requiring more and more ocean space, the number of conflicts among activities and between humans and the marine environment is expanding, contributing to a concurrent degradation of ocean health (EEA, 2015; UN, 2016).

Recognition of this reality has led to growing scientific and political attention being given to ocean governance, and, particularly, to Marine Spatial Planning (MSP). MSP has been defined as "a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process" (Ehler & Douvere, 2009, p. 18). Being a public planning process, MSP must, *i.a.*, be based on transparency and participation/stakeholder engagement (CEC, 2008), as ways to foster better decisions, buy-in of solutions (including compliance with legislation), and democratic credibility (Wates, 2006). Though relatively recent as an approach, MSP is gradually being implemented worldwide (Ehler, 2014), in Australia, the U.S., African and Asian countries, and in Europe, where a number of Marine Spatial Plans already exist (*e.g.*, UK, Belgium, The Netherlands, Germany, Norway), and a Directive establishing a framework for MSP is already in place (OJEU, 2014). Today, MSP is generally accepted as a prime tool to promote sustainable development of the marine environment (Flannery and Ellis, 2016). However, as demonstrated by recent findings on the practice of MSP (*e.g.*, Jones *et al.*, 2016), an evaluation of MSP initiatives and their performance is critical, "otherwise optimism that these ideals have been achieved because an increasing proportion of the world's seas are covered by MSP[lan]s could be misplaced or even confounded" (p. 263).

Performance evaluation, an assessment of progress toward the achievement of pre-defined goals or objectives in planning, usually based on sets of indicators, albeit often neglected, is a key learning element in the planning/governance cycle (Laurian *et al*., 2010). It allows agencies/governments and society to objectively assess how successful implementation was, namely in terms of efficiency or of efficacy, including effects on the environment and on the social-economic-institutional/governance systems such initiatives target or affect (Ehler, 2014; Gobierno de España, 2010; Mascarenhas *et al*., 2012, 2015; UNEP, 2014). In the field of public initiatives for the ocean, various frameworks have been developed for the evaluation of planning or management initiatives, such as Marine Protected Areas (MPAs), or Marine Spatial Plans (*e.g.*, Belfiore *et al.*, 2006; Douvere, 2010; Ehler, 2014; Hockings *et al.*, 2006; Pomeroy *et al.*, 2004). In terms of concrete initiatives, various Marine Spatial Plans include sets of indicators for their evaluation, namely: the Great Barrier Reef Marine Park in Australia (GBRMPA, 2014); in the U.S., Rhode Island's Special Area Management Plan (McCann *et al*., 2013, Mulvaney, 2013), and Massachusetts Ocean Management Plan (Commonwealth of Massachusetts, 2015); in Europe, Scotland's Shetland Islands Marine Spatial Plan (SIC, 2013), England's East Inshore and Offshore Marine Plans (MMO, 2014). However, despite these examples, a "low priority [is] assigned in practice to evaluation of marine management in general and MSP in particular" and there is still limited experience of MSP and insufficient implementation data (Carneiro, 2013, p. 215). As such, Carneiro concludes, evaluation on the MSP cycle still requires dedicated research.

Research on spatial planning, including on its evaluation component, has, first and foremost, "*an action orientation*", *i.e.*, an "ambition that research findings will 'make a difference'" in relation to the social and political reasons (initiatives) that motivated the research (Silva *et al*., 2015, p. xxvi). On a related note, Ferrão (2011) challenged spatial planning specialists (as mediators of dynamics and solutions) to collaborate with political agents with the objective of making public policies more efficient, specifically through promoting the evaluation of public policies from the perspective of institutional learning.

Portugal, together with the other coastal European Union countries, is currently embracing the planning of its maritime dimension. Portugal's maritime space (including the

area of continental shelf beyond 200 nautical miles) makes up 97% of the nation's territory, and includes nearly 50% of the volume of European Union's marine waters (MAM, 2014). The entire Portuguese National Maritime Space (NMS) corresponds to about 4% of the Atlantic and 1 % of the global ocean (Bessa Pacheco, 2013). Since 2014, a new bundle of national legislation has been put in place for the Portuguese NMS, including the National Ocean Strategy (NOS) 2013-2020 (Resolution of the Council of Ministers 12, 2014), and a base law for Marine Spatial Planning and Management of the Portuguese NMS, aimed to contribute to Portugal's sustainable development (Law 17, 2014). Decree-Law 38/2015, which develops Law 17/2014, determines the development of a Marine Spatial Plan for the entire NMS – the Situation Plan – and the permanent evaluation of the status of national MSP (Decree-Law 38, 2015). However, no specific metrics are as yet proposed for such an evaluation. While, in the past, little or no attention was given to the evaluation of spatial planning on land as well as on the coast (*e.g.*, Ferreira *et al*., 2013), as the marine spatial planning of the Portuguese NMS is developed and implemented, considering its dimension and geostrategic importance, it is vitally important that it is coupled from the onset with the discussion on how its performance (the success of those actions) will be evaluated: has MSP achieved what it set out to achieve, how close or far is it from achieving intended goals, including how is national MSP contributing to deliver sustainable development?

Aims and objectives of this research

The overall aim of the present study is to assist the emerging Portuguese MSP system in the development of an evaluation mechanism of its performance, by scoping out, through a participatory approach, a set of national/strategic level indicators. This research seeks to reflect on the way in which the current setup for MSP has been organized in Portugal through a critical analysis of the proposed system carried out with the involvement of experts, as a contribution to inform the participatory development of an evaluation framework for Portuguese MSP. More specifically, this research sets out to:

1. Analyse the current policy seascape for Portuguese MSP;
2. Develop a system of indicators to evaluate performance of Portuguese MSP, through a participatory approach;

3. Propose guidelines for an evaluation mechanism for the performance of Portuguese MSP.

Figure I.1. synthesises the link between the three specific objectives of this research.

Figure I.1. Link between the three specific objectives of this research.

The unique/novel contribution of this thesis is presenting a first approach to a mechanism to evaluate performance of MSP for the entire Portuguese national maritime space, using a participatory approach. The hypothesis of this research is that it is possible and desirable to use a participatory model to develop an evaluation mechanism of the performance of Portuguese MSP, where the stakeholders themselves are direct contributors to the definition and selection of indicators, help to validate the results, and promote its implementation. This proposes a shift from the current practice of top-down, unilateral, definition of evaluation mechanisms (including indicators) in MSP, towards a new, participatory, approach to the monitoring and evaluation stages of the MSP cycle, to improve its chances of implementation and success. This signifies broadening the scope of "the public process" beyond the planning stage into the planning evaluation stage. In so doing, it may potentially be useful to other coastal nations in the EU and elsewhere engaged in designing and implementing MSP systems and their evaluation mechanisms.

The research presented here is also action oriented. It is funded by the Portuguese Foundation for Science and Technology (FCT), and has the institutional support of the Portuguese Directorate-General for Sea Policy (DGPM), the national agency responsible for evaluating the status of Portuguese MSP. This financial and institutional support demonstrates the timeliness, pertinence, and practical interest of this research, at a moment when Portugal is actively involved in the strategic development and spatial planning of its maritime territory. Through this rapport with the national authorities that play a role in management of the Portuguese maritime space, this research also contributes to bring R&D activities closer to the country's planning and management/operational needs. In this framework, the participatory development of an indicator system to assess

performance of the national MSP system, constitutes a unique opportunity to place Portugal at the forefront of scientific research in the field of monitoring and evaluation of MSP: bringing together researchers and political agents (policy-makers), to reflect on the MSP process, and contributing to its implementation and monitoring, while building examples of good practices in this field, both nationally and internationally.

Methods

For the development of a mechanism to evaluate performance of the Portuguese marine spatial planning system, an approach was used based on a combination of secondary research (literature review) and primary research (data production).

Baseline study (secondary research)

A literature review (secondary research) allowed for the establishment of the state-of-the-art concerning the topics of interest relevant to the field of performance evaluation of MSP, including practical examples of experiences with particular marine spatial plans, and related fields of sustainability and ocean health. It also provided the necessary base information to support the establishment of a participatory methodology to derive a tentative set of indicators for the evaluation of the Portuguese MSP system.

Data production (primary research)

This data production component was structured in two stages:

i) ***Analysis of the Portuguese legal framework for MSP***, based on the insights and perceptions of national and international MSP experts, as a starting point to guide and frame the selection of indicators for evaluation performance of Portuguese MSP. Two studies were carried out:
   - an analysis of international experience in MSP focusing on the U.S.;
   - perceptions of Portuguese experts on the Portuguese legal framework for MSP;

ii) ***Indicator development process***.

Analysis of the Portuguese legal framework for MSP

To learn from the international practice in MSP, in view of ongoing studies on the implementation of MSP in Europe (MESMA project, in Jones *et al*., 2016), and recognising

the value of existing dialogue on ocean governance between the U.S. and Europe (*e.g.*, the CALAMAR project (2011), the Dräger Foundation's (2013) EU-U.S. conference series, the Galway Statement (2013)), it was deemed timely to consider the U.S. experience in MSP processes. In particular, understanding how the U.S. has addressed competing uses, and evaluated alternatives, is relevant to any discussion of parallel European and Portuguese efforts, and was used to highlight potential similar challenges during the implementation of Portuguese MSP.

To have a handle on the perceptions of Portuguese experts on the Portuguese legal framework for MSP, on 16 January 2015, an expert conference was organised at FCSH/UNL to discuss the Portuguese MSP legal framework at the time: the Law establishing the Basis of the Policy for Marine Spatial Planning and Management of the National Maritime Space (NMS) (MSPM Law: Law 17, 2014), and a Decree-Law Proposal developing the implementation of the MSPM Law and transposing EU's MSP Directive (later Decree-Law 38, 2015). The conference had a double objective: i) to discuss the Portuguese MSP legal framework, particularly the Decree-Law Proposal; ii) to produce a document to be sent to the government with suggestions for improvement. The conference was organized in three sessions (Spatial planning, Law, and Environment) with specialists in themes related to MSPM from academia and civil society as invited speakers.

The main findings of both analyses were used to feed the indicator selection process and the development of the MSP evaluation framework, and to contribute to the body of proposals for improving the national MSPM framework.

Indicator selection process

For the participatory development of indicators to evaluate performance of Portuguese MSP, a mixed-methods approach was adopted consisting of a combination of qualitative findings from expert/stakeholder interviews, substantiated by quantitative indicator rankings from questionnaires and votings.

The approach was structured as a step-by-step iterative process, consisting of five steps: steps 1 and 2 encompassed a preparatory stage where legally stated MSP objectives were identified and coupled with potentially relevant indicators referred to in the MSP

evaluation bibliography. Steps 3-5 consisted of the participatory part of the process. The five steps are detailed below:

Step 1 – Identify adequate objectives: identification of the most appropriate source of objectives to assess performance of national MSP;

Step 2 – Pre-selection of indicators: identification of potentially relevant indicators in relation to the objectives of national MSP, selected from the national and international literature on the topic of MSP evaluation;

Step 3 – Indicator screening by experts: screening of selected indicators through one-on-one semi-structured interviews with national and international experts in the fields of MSP and evaluation to streamline a list of relevant indicators, based on qualitative and quantitative data;

Step 4 – Participative workshop: independent expert discussion exercise with Portuguese MSP practitioners and other MSP related agents and stakeholders, including but not limited to the experts involved in the preceding step, to discuss the streamlined list of indicators and select the most relevant ones.

Step 5 – Public debate session: A public session for the presentation of the indicators selected, focused on obtaining high-level institutional feedback from the heads of the main agencies responsible for Portugal's MSP, and on providing an opportunity of opening the debate to, and getting feedback from, a wider audience of stakeholders/public.

This iterative approach was designed as an adaptation of the Delphi method or Delphi technique (Hsu & Sandford, 2007; Linstone & Turoff, 2002; Thangaratinam & Redman, 2005) to fit the specificities of this research.

Throughout this research there was a continued focus on the publication and dissemination of results in various media as they were being produced (peer-reviewed papers, online technical reports, short notes in newspapers and newsletters), with the two-fold purpose of integrating feedback and thus improving/strengthening and validating the results obtained, and of extension: communicating MSP to a wider audience and thus contributing to a more informed society.

Structure of the thesis

The thesis consists of an introduction, five chapters, and a conclusion.

Chapter 1, "Sustainable development in the Pale Blue Dot", frames marine spatial planning as the most widely accepted ocean governance tool for sustainable development in the marine environment. The concepts of sustainable development and of planetary boundaries on our Ocean planet, where the health of the marine ecosystem continues to degrade, are discussed to frame the discussion on sustainable development goals and of the need for strong ocean governance frameworks and tools. It also reviews the emergence and development of MSP worldwide, and more particularly in the EU, in terms of the drivers, policies and established principles and guidelines for MSP.

Chapter 2, "The revenge of Portugal's geography", integrates two main sections. The first section explains why Portugal is ideally suited as a case study for furthering research on mechanisms to evaluate performance of MSP. It shows the way in which Portugal's geography – particularly its geostrategic position over the Atlantic – has shaped the nation's history and culture, and how, in turn, these have influenced the world's vision of the ocean and international ocean governance policies, since the 1400s to the present day. The second section presents in detail Portugal's legal framework for MSP (finalised in 2015), and offers two distinct analyses the MSP framework, based on distinct studies conducted as the legal framework was being developed. The first analysis was based on perceptions of U.S. MSP practitioners, drawing from their practical experience to highlight challenging aspects in the real-world implementation of MSP, and to reflect on how such aspects are being considered in the Portuguese legal framework and how they can be improved, to promote better implementation. Drawing from the U.S. MSP experience, aspects related to the incorporation (or not) of existing uses in MSP processes, and criteria deemed relevant in an analysis of alternatives were researched (results published in Ferreira *et al.*, 2015). The second analysis presents results of an expert conference held at FCSH/UNL in January 2015 to debate the developing Portuguese legal framework (prior to the publication of Decree-Law 38/2015). The main objective of this expert debate was to contribute constructively to the legal framework, while it was still being developed, by offering suggestions to improve

aspects, which, in the experts' understanding constituted weaknesses or threats to optimal implementation (results published in Ferreira *et al.*, 2015b, 2015c).

Chapter 3, "Evaluation and indicators in planning", reviews the importance of evaluation in planning, namely performance evaluation, particularly in marine policy frameworks and marine spatial planning and related plans and justifies the need to develop further the field. It reviews definitions and ideal characteristics of indicators and of indicator selection criteria, and presents an overview of useful indicator frameworks (it uses results of secondary research published in UNEP, 2014). The chapter also includes a section on the evaluation of coastal and ocean plans and policies in Portugal.

Chapter 4, "Indicator system development process: methods and results", presents in detail the five components of the step-by-step methodology designed for the development of an indicator system for the performance evaluation of Portuguese MSP (includes results published in Ferreira, 2016, 2016b; Ferreira *et al.*, 2016, 2016b). It also includes the presentation and assessment of the dissemination/communication initiatives carried out during this study.

Chapter 5, "Discussion" includes the presentation and discussion of a framework for evaluating performance of Portuguese MSP followed by the proposal of a generalised simplified model for the evaluation of MSP performance (includes results published in Ferreira *et al*., 2014). A critical evaluation of the methodological approach is also carried out focusing on four key aspects of the adopted approach and exploring potential strengths and weaknesses: the choice of basing the analysis on legally stated objectives, a discussion on indicators, the involvement of stakeholders in the process, and the focus on outreach and communication. The last section of the chapter reflects on recent findings from the reality of MSP implementation, and on the results of the analyses of the Portuguese legal framework presented in chapter 2 to present recommendations on aspects deserving particular attention and further development in the next stage of MSP in Portugal: the development, implementation, and evaluation of the situation plan (includes results published in Ferreira *et al*., 2016c, 2016d).

The “Conclusions” highlight the original contribution of this research to evaluate performance of Portuguese MSP, including an assessment of the achievement of general and specific objectives of this research and a summary of the strengths and weaknesses of the adopted approach. A list of specific recommendations to improve performance evaluation of Portuguese MSP is presented. Attention is drawn to the unique role of the social sciences in forwarding a better practice in MSP.

As mentioned above, parts of the research included in this thesis have already been published in peer-reviewed papers and reports, excerpts of which are used in this manuscript (a note is made at the head of the chapters whenever that is the case). As such, not all references consulted during this research are used (and listed) in this manuscript. Some will only be found in the original full texts of the papers/reports.

All translations from Portuguese originals are by the author.

Chapter 1 – Sustainable development in the pale blue dot

Sou a estrela do mar
Só a ele obedeço, só ele me conhece
Só ele sabe quem sou no princípio e no fim
Só a ele sou fiel e é ele quem me protege
Quando alguém quer à força
Ser dono de mim

(I am the sea star,
I only obey the sea, only the sea knows me
Only he knows who I am in the beginning and the end
Only to him I am faithful and it is he who protects me
When someone wants by force
To own me)

Jorge Palma (2000)

Chapter 1 - Sustainable development in the Pale Blue Dot

1.1. "You are here"[1]

In early February 1990, as *Voyager 1* dashed across space to explore the universe beyond the outer limits of the solar system, it received one last command from Earth: to tilt back its camera and capture one final image of our planet. Carl Sagan explained that he "thought it might be a good idea (…) to have them take one last glance homeward" (Sagan, 1997, p. 10). He anticipated that our planet "would be just a point of light, a lonely pixel, hardly distinguishable from the many other points of light *Voyager* could see (…). But precisely because of the obscurity of our world thus revealed, such picture might be worth having" (*ibid.*).

The resulting image was thus described and explained by Sagan (*ibid*.):

> *… a mosaic of squares laid down on top of the planets and a background smattering of more distant stars. (…) From this distance the planets seem only points of light (…) Because of the reflection of sunlight off the spacecraft, the Earth seems to be sitting in a beam of light, as if there were some special significance to this small world. But it's just an accident of geometry and optics. (…) And why that cerulean color? The blue comes partly from the sea, partly from the sky.* (p. 11).

He finished the description by sharing his reflections on this "pale blue dot":

> *… from this distant vantage point, the Earth might not seem of any particular interest. But for us, it's different. Look again at that dot. That's here. That's home. That's us. (…) everyone you love, everyone you know, everyone you ever heard of (…) in the history of our species lived there—on a mote of dust suspended in a sunbeam (…) There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known* (p. 12-13).

[1] Title of Carl Sagan's first chapter in his book "Pale Blue dot" (Sagan, 1997).

Sagan's idea of taking this picture of Earth from a spot in space 6 billion km away from our planet was to put in perspective, from 1,000 times farther away, the iconic picture taken in 1972 during the last manned mission to the Moon. From the vantage point of the astronauts on board Apollo 17, the Earth looked like a Blue Marble in the vastness of space. Sagan (1997) wrote:

> *While almost everyone is taught that the Earth is a sphere with all of us somehow glued to it by gravity, the reality of our circumstance did not really begin to sink in until the famous frame-filling Apollo photograph of the whole Earth* (p. 11).

1.2. Sustainable development

In fact, that one image taken in December 1972, added visuals to the global message conveyed a few months prior, in June 1972, by the United Nations Conference on the Human Environment. The 1972 Stockholm Convention, as it became known, drew the world's attention to global environmental degradation and stated the first global principles of sustainable development[2].

In 1983, Gro Harlem Brundtland was called upon by the United Nations to establish and chair a World Commission on Environment and Development to charter "a global agenda for change" with the mandate, first and foremost, "to propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond" (WCED, 1987, p.5). In this Commission's report, "Our Common Future" (a.k.a. "Brundtland report"), environment was defined, simply and unequivocally, as "where we all live", and which "does not exist as a sphere separate from human actions, ambitions, and needs", and development as "what we all do in attempting to improve our lot within that abode. The two are inseparable". Concerning sustainability, the report stated that "Many of the development paths of the industrialized nations are clearly unsustainable. And the

[2] Principle 1 of the Declaration issued therein stated that "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations" (UNEP, 2016). Principle 2 referred to the safeguard of the Earth's natural resources (including especially representative samples of natural ecosystems) "for the benefit of present and future generations through careful planning or management, as appropriate" (ibid). After the 1972 Stockholm Conference, "several states recognized in their Constitutions or laws the right to an adequate environment and the obligation of the state to protect that environment" (WCED, 1987, p. 271).

development decisions of these countries, because of their great economic and political power, will have a profound effect upon the ability of all peoples to sustain human progress for generations to come" (WCED, 1987, p.7), especially to support the increasing pressure and demands of a rapidly growing human population. As such, preference for "sustainable development" over "sustainable growth" (an expression that appeared only once in the Brundtland report), marked a deliberate choice and the recognition, in 1987, of the existence of limits to growth on a finite planet (cf. Meadows *et al*., 1972). The universal adoption, at least on paper, of this new paradigm of sustainable development, took place at the Earth Summit in Rio de Janeiro, in 1992. Sustainable development has since become a major policy driver, from the global to the local level, and may be viewed as the dominant paradigm in various fields of planning and management (Gallagher *et al.*, 2004).

The ecosystem approach

Recognition of the "alarming rate" of species extinction caused by human activities, led the United Nations Environment Programme (UNEP), as early as 1988, to convene an expert working group to develop an international legal instrument "for the conservation of sustainable use of biological diversity" – the Convention on Biological Diversity (CBD), opened for signature at the 1992 Rio Conference (CBD, undated). Within the context of the CBD emerged the concept of an ecosystem approach to management or ecosystem-based management (EBM) "as a paradigm to explicitly account for the interconnectedness among systems, the cumulative impacts to ecosystems and to integrate ecological, social, economic and institutional perspectives, recognising their strong dependencies" (SCBD/STAP-GEF, 2012, 11). As defined in the CBD, "the ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way" recognizing that "humans, with their cultural diversity, are an important component of many ecosystems" (SCBD, 2004, p.6). The twelve principles of the ecosystem approach stated in Decision VII/11 of CBD's Conference of the Parties are listed in Table 1.1. (*ibid*.).

McLeod and Leslie (2009) recall that EBM is "grounded on the idea that ultimately we are managing people's influences on ecosystems, not ecosystems themselves" (p. 4), and highlight three key aspects of EMB:

i) *Acknowledging connections*, including, first and foremost, the inextricable dynamic linkages between ecosystems and social systems, or "coupled social-ecological systems", meaning that "EBM is fundamentally a place-based approach" (p. 4);

ii) *Cumulative impacts* of multiple activities (and the individual actions therein) and how they affect the delivery of ecosystem services[3] that flow from these coupled social-ecological systems;

iii) *Multiple objectives*, *i.e.*, the range of benefits humans receive from ecosystems, "rather than single ecosystem services" (*ibid.*).

Table 1.1. The 12 principles of the ecosystem approach (SCBD, 2004).

1. The objectives of management of land, water and living resources are a matter of societal choice.
2. Management should be decentralized to the lowest appropriate level.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
4. Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should: a) Reduce those market distortions that adversely affect biological diversity; b) Align incentives to promote biodiversity conservation and sustainable use; c) Internalize costs and benefits in the given ecosystem to the extent feasible.
5. Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.
6. Ecosystems must be managed within the limits of their functioning.
7. The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.
8. Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.
9. Management must recognize that change is inevitable.
10. The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.
11. The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The ecosystem approach should involve all relevant sectors of society and scientific disciplines.

Planetary boundaries

Between the Rio Conference and the present, countless initiatives have been promoted worldwide, at all geographical scales, to the end of promoting sustainable development, with still insufficient results in terms of global sustainability. While, in "Beyond the limits", Meadows *et al*. (1992) concluded that the Earth's vital ecological limits had already been exceeded and that they could even collapse by the middle of the 21st century, in 2009, Rockström and co-authors drew attention to how the Earth's environment

[3]Ecosystem services may be defined as "the benefits human populations derive, directly or indirectly, from ecosystem functions" (Costanza *et al.*, 1997, p. 253).

has been deviating from the stable Holocene conditions that allowed the development of human civilizations, diverging from what they called a "safe operating space for humanity" [4] (Rockström *et al*., 2009). These authors proposed a framework based on nine planetary boundaries, three of which, in their estimation, had already been exceeded: rate of biodiversity loss, climate change, and human interference with the nitrogen cycle. In 2015, the planetary boundary framework was developed and updated, with four boundaries now believed to have been crossed: extinction rate, deforestation, atmospheric carbon dioxide (as an element of climate change), and flow of nitrogen and phosphorus (Stephen *et al*., 2015)[5].

Recognizing the importance and validity of the planetary boundaries framework, the European Union, through its Environment Action Programme to 2020, has set a long term vision for 2050, of "living well, within the limits of our planet" (OJEU, 2013).

Sustainable Development Goals – Goal 14

In 2015, the United Nations put out its "2030 Agenda for Sustainable Development", "a plan of action for people, planet and prosperity" where the protection of the natural environment is the cross-cutting foundation for sustainable development (UN, 2015). The Agenda established seventeen sustainable development goals – one of them, goal 14 to "Conserve and sustainably use the oceans, seas and marine resources" (UN, 2015). The paramount importance of this goal has been simply summed in Lorna Inniss and Alan Simcock's (Joint Coordinators of the 1st World Ocean Assessment) statement "Globally, the drive towards sustainable development cannot ignore the seven-tenths of the planet covered by the ocean. (…) We need to understand the overall benefits of the ocean to us humans, and the overall impacts of humans on the ocean" (UN, 2016)[6].

Despite its vastness and the remoteness of some Ocean areas, virtually all of it is affected by some type of human pressure (Halpern *et al*., 2008). The *First Global Integrated*

[4] Perhaps one of the most compelling explanations of this "safe operating space for humanity" was provided by Eugene P. Odum (1993, 1997), who used the Apollo 13 accident as a metaphor of "spaceship" Earth "and our endangered life-support systems".

[5] Other boundaries are ozone depletion, freshwater use, atmospheric aerosol loading, chemical pollution (renamed "introduction of novel entities" to include radioactive and nanomaterials), and ocean acidification.

[6] While the ocean "covers over three quarters of the Earth's surface, contains 97% of the Earth's water, and represents 99% of the living space on the planet by volume" (UN, 2015) "more than 95% of this realm remains unexplored" (NOAA, 2014).

Marine Assessment – World Ocean Assessment I, carried out under the auspices of the United Nations, and published in 2016, concluded (UN, 2016):

> i) Climate change and related atmospheric changes seriously impact the ocean, which shows trends of increasing sea level rise and acidification, and decreased mixing and oxygenation;
>
> ii) Global capture fisheries are "near the ocean's productive capacity" and there is unsustainable exploitation of living marine resources in many regions, which, sometimes coupled with pollution, causes ecosystem changes, and decreased productivity of fish stocks, *i.a.*, jeopardizing food security and biodiversity[7];
>
> iii) There are increasing pressures on marine biodiversity, not only close to densely populated areas but also in the open ocean. Many biodiversity "hotspots" have become "magnets for human uses" increasing the potential for human pressures;
>
> iv) Increasing amounts of pollution from land-based sources, from our growing human population, and the associated industrial and agricultural production (plastics, other harmful materials, excess nutrients) exceed local carrying capacity and have deleterious social, economic and environmental consequences;
>
> v) Despite improvements, globally there is still and uneven distribution of the benefits provided by the Ocean, contributing to reduce the capacity of less developed countries to address the causes of ocean degradation;
>
> vi) Increasing use of ocean space, both from the expansion of existing activities and from the development of new ones, increase "the potential for conflicting and cumulative pressures" particularly as "in most cases, those various activities are increasing without any clear overarching management system or a thorough evaluation of their cumulative impacts on the ocean environment" (ibid, p. 8);
>
> vii) Sustainable ocean use cannot be achieved without coherent and overall management of the various activities affecting the ocean, based on vaster and more integrated knowledge on the ocean;

[7] Cf. also Callum Roberts (2007) "The Unnatural history of the sea: the past and future of humanity and fishing" for an account of the centuries-old degradation of fishing stocks by fisheries worldwide and their potential recovery.

viii) Delays in implementing known measures to counteract the pressures identified above means that "we are unnecessarily incurring those environmental, social and economic costs" (*ibid.* p. 10).

Regionally, the status of Europe's seas is deemed to be "poor", with "a range of human-induced pressures affecting the state of marine ecosystems directly" (EEA, 2015, p. 188). One important finding of the EEA's 2015 "State of Europe's Seas" report is "how the activities using non-living marine natural capital are exerting a greater range of pressures on the living natural capital (*i.e.* marine ecosystem capital) than those activities using the latter" generating "equity issues, as those dependent on healthy seas like fishing, aquaculture, tourism and biotechnology, may have their development opportunities hindered by those who do not depend directly on a healthy ecosystem" (*ibid.*, p. 189).

Clearly, dealing with the multiple and increasing pressures placed on the Ocean is an urgent task requiring adequate governance and management systems and thorough evaluation of cumulative impacts, grounded on solid knowledge.

1.3. Ocean governance and marine spatial planning

Until relatively recently, conflicts associated with human activities in the maritime space were perceived as being few, limiting the interest in dedicated planning and integrated management efforts. Conflicts (among users or between users and the marine environment) were solved on a case-by-case or on a sectoral basis (Cicin-Sain & Knecht, 1998; Ehler & Douvere, 2009). On the other hand, the existence of different jurisdictions over the coast and maritime space, and its sheer complexity (its fluid and dynamic nature and its complex ecology), have frustrated the integrated management of this space, and, inherently, of its planning (Cicin-Sain & Knecht, 1998; CEC, 2008).

The doctrine of the "freedom of the seas", put forward by the Dutch Hugo Grotius in 1609, prevailed almost until the end of the 20th century, when the 1982 United Nations Convention on the Law of the Sea (UNCLOS or LOSC, or Montego Bay Convention) came into force. Since then, a plethora of legislation for marine management, including international, regional and national laws, sprung, typically addressing sectors separately. On the one hand, this has resulted in such a high degree of complexity across vertical marine governance

structures that attempts to come to grips with the components and interlinkages among these various instruments have earned them the name of “horrendograms” (Boyes & Elliott, 2014). On the other hand, such a sectoral (or case-by-case) approach has typically resulted in conflict either among different human uses (user-user conflicts) or between uses and the environment (user-environment conflicts) (Ehler & Douvere, 2009). The problem, as these authors point out, is that “these conflicts weaken the ability of the ocean to provide the necessary ecosystem services upon which humans and all other life on Earth depend” (*ibid.*, p. 19).

Marine spatial planning evolved in this context as a way to promote “a more rational organization of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect marine ecosystems (…) (Ehler & Douvere, 2009, p. 18) (cf. Table 1.2. for definitions of MSP).

Table 1.2. Definitions of Marine Spatial Planning (MSP).

Source	**Definition of MSP**
UNESCO-IOC’s Marine Spatial Planning Initiative webpage (UNESCO-IOC, 2015)	A public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process. Characteristics of MSP include ecosystem-based, area-based, integrated, adaptive, strategic and participatory.
*Marine Spatial Planning in the Context of the Convention on Biological Diversity (*SCBDSTAP—GEF, 2012, p. 6)	A framework which provides a means for improving decision-making as it relates to the use of marine resources and space. It is based on principles of the ecosystem approach (EA) and ecosystem-based management (EBM). All MSP exercises are spatial (place-based) management processes no matter at what scale and in what social context or biome it is being practiced. It is also temporal, utilizing forecasting methods and fully taking into account seasonal dimensions.
Directive 2014/89/EU establishing a framework for maritime spatial planning (EU, 2014, p. L 257/140)	A process by which the relevant Member State’s authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives;
Executive Order 13547 -- Stewardship of the Ocean, Our Coasts, and the Great Lakes (White house, 2010, p.2)	The term "coastal and marine spatial planning" means a comprehensive, adaptive, integrated, ecosystem-based, and transparent spatial planning process, based on sound science, for analyzing current and anticipated uses of ocean, coastal, and Great Lakes areas. Coastal and marine spatial planning identifies areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives. In practical terms, coastal and marine spatial planning provides a public policy process for society to better determine how the ocean, our coasts, and Great Lakes are sustainably used and protected -- now and for future generations

At the onset, MSP was associated with the management of marine protected areas (MPAs) and nature conservation, starting in Australia's Great Barrier Reef Marine Park, whose first spatial plan was developed in 1981, and in 1997, in the United States, with the Florida Keys National Marine Sanctuary Management Plan (Douvere, 2010; NOAA, 2011). More recently, in densely used marine areas, marine spatial management of multiple uses (including nature conservation) has progressively been implemented (Douvere, 2010).

Though relatively recent as an approach, MSP is being increasingly endorsed and used worldwide as a tool to the integrated management of growing human demands on marine resources (Ehler, 2014; UNESCO-IOC, 2015). In fact, according to Flannery *et al*. (2016), MSP "has rapidly become the most commonly endorsed management regime for sustainable development in the marine environment" (p. 121) and is now considered one of the most pragmatic tools to implement Ecosystem-Based Management (EBM) (Douvere, 2010; SCBD/STAP-GEF, 2012)[8].

MSP is *ecosystem-based*, *integrated* (horizontally, across sectors/agencies, and vertically, among levels of government), *place- or area-based*, *adaptive*, *strategic and anticipatory* (focusing on the long-term), and *participatory* (Ehler & Douvere, 2009). In fact, according to these authors, MSP is, in many ways, similar to integrated coastal management (ICM) in that both approaches are "integrated, strategic, and participatory" and that "both aim to maximize compatibilities among human activities and reduce conflicts" (user-user; user-environment) (ibid, p. 22).

1.4. MSP in Europe

In line with the international arena, over the last decade the European Union (EU) has developed its policy framework for integrated ocean management and MSP. Among the most relevant elements are the Integrated Maritime Policy (IMP), the Roadmap for MSP, the Marine Strategy Framework Directive (MSFD), the European Strategy for the Atlantic Ocean

[8] ICES (2005, p.4) has offered a definition of the Ecosystem Approach for the marine environment as 'a comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of the marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.'

area, the EC's Communication on Blue Growth, and the 2014 Directive for Maritime Spatial Planning.

The IMP, published in 2007, was "based on the clear recognition that all matters relating to Europe's oceans and seas are interlinked, and that sea-related policies must develop in a joined-up if we are to reap the desired results" (CEC, 2007, p. 2)[9]. The IMP aimed to "provide a coherent policy framework that will allow for the optimal development of all sea-related activities in a sustainable manner" (*ibid*., p.4) and elected MSP as a "key planning tool for sustainable decision-making" (*ibid.*, p. 5), highlighting that actions under the IMP would be guided, *i.a.*, by the ecosystem approach.

In 2008, the European Commission published a Roadmap for MSP[10]. It highlighted the benefits of a European approach, and stressed that "MSP does not replicate terrestrial planning at sea, given its tri-dimensionality and the fact that the same sea area can host several uses, provided they are compatible." (CEC, 2008, p. 10). It stated that MSP is "a tool for improved decision-making" (*ibid.*, p. 2) and that it is "a process that consists of data collection, stakeholder consultation and the participatory development of a plan, and the subsequent stages of implementation, enforcement, evaluation and revision." (*ibid.*, p. 3). This communication defined ten common key MSP principles for the EU emerging from international practice in MSP (Table 1.3.)

Table 1.3. The ten key principles of MSP stated in the EU's 2008 MSP Roadmap (CEC, 2008). The ecosystem approach was recognized as the overarching principle of MSP and added to this list in 2010 (EC, 2010b).

Ecosystem approach
1) using MSP according to area and type of activity
2) defining objectives to guide MSP
3) developing MSP in a transparent manner
4) Stakeholder participation
5) Coordination within Member states – simplifying decision processes
6) ensuring the legal effect of national MSP
7) Cross-border cooperation and consultation
8) incorporating monitoring and evaluation in the planning process
9) achieving coherence between terrestrial and maritime spatial planning – relation with ICZM
10) a strong data and knowledge base

[9] This is in line with the recognition stated in UNCLOS' preamble that "the problems of ocean space are closely interrelated and need to be considered as a whole" (UN, 1982, p. 25).

[10] This document stipulates the preference for the expression "maritime spatial planning" over "marine spatial planning" reportedly "to underline the holistic cross-sectoral approach of the process". This choice is retained in the entire body of European legislation regarding MSP, and thus marks a difference from the international adoption of "marine spatial planning" (*e.g.*, U.S., UNESCO).

In 2010, the EC revisited these principles based on the debate it had launched on the wake of the MSP roadmap. It resulted in an overall agreement over the ten MSP principles previously published, to which one overarching principle for MSP was added, placed first and foremost – the ecosystem approach – recognizing that "the ecosystem must form the basis of the overall framework for MSP" (EC, 2010b, 3).

The Marine Strategy Framework Directive (MSFD), published in 2008, and referred to as the environmental pillar of the IMP (EC, 2010), determined that member states should "take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest" (OJEU, 2008, p. L 164/24). For that purpose, member states would have to develop marine strategies "to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they: (a) have been adversely affected; and (b) prevent and reduce inputs in the marine environment, with a view to phasing out pollution (…) so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea" (*ibid*., p. L 164/24). The directive indicated eleven qualitative descriptors for the determination of good environmental status (GES) (Table 1.4.) Each coastal member state was also obligated to produce a monitoring programme for an assessment of, and estimate of distance from and progress to, GES, and programmes of measures in order to achieve or maintain GES in their marine waters.

Table 1.4. The eleven descriptors for the determination of Good Environmental Status under the MSFD (OJEU, 2008).

1) biological diversity maintained
2) non-indigenous species at levels that do not adversely alter ecosystems
3) populations of commercially exploited (shell)fish within safe biological limits
4) all elements of marine food webs at normal abundance and diversity and at levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity
5) human-induced eutrophication minimised
6) Sea-floor integrity (structure and functions of the ecosystems are safeguarded and benthic ecosystems not adversely affected)
7) Permanent alteration of hydrographical conditions does not adversely affect marine ecosystem
8) Concentrations of contaminants within safe levels
9) Contaminants in fish and other seafood for human consumption within safe levels
10) marine litter non detrimental to the coastal and marine environment
11) Introduction of energy (incl. underwater noise), at levels that do not adversely affect the marine environment

In 2011, a Maritime strategy of the Atlantic Ocean Area was launched with five objectives concurring to the "overriding objective of creating sustainable jobs and growth" of EUROPE 2020 (EC, 2011): implementing the ecosystem approach; reducing Europe's carbon footprint; the sustainable exploitation of the Atlantic seafloor's natural resources (marine raw materials); responding to threats and emergencies; and socially inclusive growth. The corresponding action plan - Action Plan for a Maritime Strategy in the Atlantic area: Delivering smart, sustainable and inclusive growth – was published in 2013 to be implemented through to 2020. It was meant as an invitation to the private sector, academia, public bodies and other stakeholders to designing projects aimed to respond to four priorities: 1) promote entrepreneurship and innovation; 2) protect, secure and develop the potential of the Atlantic marine and coastal environment; 3) improve accessibility and connectivity; and 4) create a socially inclusive and sustainable model of regional development.

Meanwhile, in 2012, a Communication on Blue Growth was put forward by the EC. It was described as the maritime dimension of the Europe 2020 strategy[11], and, more precisely, as "an initiative to harness the untapped potential of Europe's Oceans, seas and coasts for jobs and growth" (EC, 2012 p.2), and aimed to drive forward the IMP, helping "to steer the EU out of its current economic crisis" by promoting the blue economy (*ibid.*, p3). It was envisaged as being able to "contribute to the EU's international competitiveness, resource efficiency, job creation and new sources of growth whilst safeguarding biodiversity and protecting the marine environment, thus preserving the services that healthy and resilient marine and coastal ecosystems provide" (*ibid*.). In addition to traditional sectors of the blue economy deemed crucial for value and jobs (shipbuilding and ship repair, cargo and ferry transport, fisheries, and offshore oil and gas) five new focus areas were identified: blue energy (marine renewable energies such as offshore wind, tidal, wave, and ocean thermal energy conversion); aquaculture; tourism (maritime, coastal, and cruise); marine mineral resources; and blue biotechnology (medicines, industrial enzymes).

Lastly, in 2014, a directive establishing a framework for MSP was "aimed at promoting the sustainable growth of maritime economies, the sustainable development of marine areas, and the sustainable use of marine resources" (OJEU, 2014, p. L257/139). The

[11] EUROPE 2020 strategy for smart, sustainable and inclusive growth (EC, 2010).

directive formally defined "maritime spatial planning" as "a process by which the relevant Member State's authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives" (*ibid*., p. L257/140). Article 5 of the directive defined the objectives of MSP to be considered by Member States: "to consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and to promote the coexistence of relevant activities and uses" aiming to contribute "to the sustainable development of energy sectors at sea, of maritime transport, and of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment, including resilience to climate change impacts. In addition, Member States may pursue other objectives such as the promotion of sustainable tourism and the sustainable extraction of raw materials." Article 6 defined minimum requirements that the implementation of MSP by EU member states should include while pursuing the stated objectives: a) land-sea interactions; b) environmental, economic and social aspects, as well as safety aspects; c) promote coherence between MSP and ICM; d) ensure stakeholder involvement; e) organise the use of best available data; f) ensure trans-boundary cooperation between member states and g) promote cooperation with third countries[12]. It further stipulated the need for member states to review their maritime spatial plans at least every 10 years. Relevant member states are required to transpose the MSP directive by September 2016, and establish maritime spatial plans, at the latest by the end of March 2021.

1.5. Chapter summary

The chapter starts with a marker of Earth's position in the solar system, to introduce the concepts of sustainable development, ecosystem-based management, planetary boundaries, and sustainable development goals, as they are key to an understanding of the need and importance of ocean governance and marine spatial planning (MSP). MSP, "a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually

[12] These minimum requirements mirror, even if incompletely, the key EU principles for MSP enumerated above.

have been specified through a political process" (Ehler & Douvere, 2009, p. 18), is the most commonly endorsed management regime for sustainable development in the marine environment and is now considered one of the most pragmatic tools to implement ecosystem-based management. The chapter closes with the description of the policy framework relevant for MSP in Europe. The information presented here informs the next chapters but is particularly relevant for the discussion in chapter 5.

Chapter 2 – The revenge of Portugal's geography

Includes results already published in:

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It ain't no mistery
If it's politics or history
The thing you gotta know is
Everything is show biz

Mel Brooks (1968)

Chapter 2 – The revenge of Portugal's geography

> *To us, Portuguese, the sea (…) was never a matter of fashion. With half the continental territory bathed by the waters of the Atlantic, and with the Autonomous Regions of the Azores and Madeira located in the mythic region of Macaronesia, "atlanticism" is part of our genetic code.*
>
> (Ribeiro, 2013, p. 43)

2.1. Portugal, the Mediterranean, and the Atlantic

In the age of jet planes, where it is possible to fly to the antipodes of Earth in a matter of hours, and of the internet, where information travels close to the speed of light, some might feel tempted to think that "geography no longer matters" (Kaplan, 2012, p. xix). However, according to Robert D. Kaplan, nothing could be further from the truth. In his essay "The revenge of Geography", the author sets out to restate the importance of geography in explaining world politics (much more so than governments or political regimes), defending that "the more we look out over the span of the centuries, the more that geography plays a role" (*ibid.*, p. xx). In Europe, particularly, "the 'westerly excrescence' of the continent of Asia", the author argues that "it is the delicious complexity" of its geography, "in a 'congenial' ecozone between the deserts of Africa and the ice sheets of the Arctic", with its indented coastline of 23,000 miles, as long as the Earth's circumference, that explains how it "came to dominate world politics in the course of the second millennium A.D." (*ibid*., p. 136-137).

Portugal is a case in point: the mainland, a narrow strip of land, along the Atlantic edge of the Iberian Peninsula, located at the Finisterre of Europe; and the archipelagos of Madeira and the Azores. Portugal's strong connection to the ocean, in historical, social, political, economic and cultural terms, is, and has been, first and foremost determined by the country's geography (Pitta e Cunha, 2011). For this author (*ibid*.):

> *(…) the prominent maritime component of Portugal's history, when combined with the inescapable maritime geography of the present, as well as with the geography that is projected in the future, through the delimitation of the Portuguese continental*

> *shelf, is a manifestly singular value and something that remains, together with the Portuguese language, as one of most significant actives that Portugal possesses" (ibid., p. 9).*

In fact, this author argues, it was ignorance about the true importance of geography for Portugal, believing it was nothing more than history and past, which led the Portuguese in the last three to four decades, since the country became a (terrestrially peripheral) member of the EU, to turn their backs to the ocean, and face continental Europe. For Pitta e Cunha, ignoring geography was a strategic error, and the author urged Portugal to reconcile with and embrace geography within its development model.

In "Portugal, the Mediterranean, and the Atlantic: geographic study" written in 1945 by Portugal's foremost geographer Orlando Ribeiro, the author borrowed the words of Pequito Rebelo, written 16 years prior, to summarize Portugal's identity: "Portugal is *Mediterranean* by nature, *Atlantic* by position" (Ribeiro, 1945, p. 63). Ribeiro explained:

> *At the oceanic edge of Iberia, the Portuguese land, bathed by the Atlantic, suffers its influence, in the climate, more moderate and damp, in the environment, allowing for another type of plant cover, in the connections between man and the liquid element, which are not the same as those around an interior sea, bordered by known lands, and an ocean, mysterious and huge* (*ibid*.).

However, while strictly speaking, Portugal is indeed Atlantic, the Mediterranean influence permanently and indelibly shapes the territory and its people in its various dimensions (ecological, social, cultural, historical, …), namely by "spreading ideas and techniques that are today such a large part of the European heritage" (Ribeiro, 1945, p. 52). According to Ribeiro (1945), the indented maritime littoral of this inner sea, was "carved for man to rehearse the first navigation routes" (p. 20), but, he noted, "large scale navigation emancipated from reference points on land, while it owes much to the experience of the Mediterraneans, only became possible when the Portuguese solved, in a definite way, the problems of positioning and the knowledge about navigation routes." (p. 51)[13].

[13] This realization was translated into verse by Fernando Pessoa in Mensagem (1934): " (…) the finite sea may be Greek or Roman: the endless sea is Portuguese".

All around the Mediterranean, political unity always rested upon a strong continental base. Portugal, Ribeiro pointed out, is the only nation that doesn't follow this rule. Portugal's geography or, as Pitta e Cunha underlines "the geographic position of the territory where Portugal exists today" (*ibid.*, p. 10), determines the very strong bond between the ocean and the country's history. Long before the birth of Portugal as a nation, sailors from around the Mediterranean, from Carthage, Phoenicia, Greece, and Rome reached the south-western Atlantic shores of Iberia, and exchanged merchandises, knowledge, language, and also genes with the locals. The definite contours of the country's continental territory were only definitely established in the 13th century, when conquests on land were supported by sea vessels (Romero Magalhães, 2015).

For British reporter Martin Page, author of "The first global village: how Portugal changed the world", the Portuguese had, over the last centuries, a pivotal role in conveying ideas, knowledge, and technologies to Europe and to the world (Page, 2002). The Ocean, which, literally, paved the way for this first globalization event, is also inextricably linked with Portuguese culture (Simões & Salvador, 2013). For Romero Magalhães, a Portuguese historian, "nearly everything important in [Portugal's] collective existence is tied to the sea" (Romero Magalhães, 2015, p. 87)[14]. The very name of the nation derives from a coastal settlement established by the romans on the mouth of the Douro river, *Portucale,* where the city of Porto (meaning, literally, port or harbour), is located today. Portuguese is the official idiom in Portugal, Brazil, Angola, Mozambique, Cape Verde, São Tomé & Príncipe, Guinea-Bissau, East-Timor, and Macao (Special Administrative Region of the People's Republic of China), all of them coastal territories. Portuguese professor, novelist, and philosopher, Vergílio Ferreira, in the acceptance speech of the Europalia Prize for Literature in Brussels in 1991, conclusively explained how the Portuguese language is inextricably linked to the Ocean:

> *A language is the place from where one sees the World and from where the boundaries of one's thinking and feeling are drawn. From my language one can see the sea. From my language one can hear its murmur, as from that of others one*

[14] For a glimpse of the importance of the sea in Portuguese cultural identity, cf., *e.g.*, João, 2015. In poetry, the artistry of Camões and Fernando Pessoa concerning Portugal's maritime history cannot be overemphasized.

> *might hear the forest, or the desert's silence. That is why the voice of the sea was that of our restlessness* (published in Ferreira, 1999[15]).

2.2. Placing the ocean on the international agenda

In the early 15th century, under the influence of Prince Henry, the Portuguese invaded Ceuta, in Northern Africa, and ventured to the discovery of the unknown: the "tenebrous" "Ocean sea", as the Atlantic was then referred to (Carvalho *et al*., 2015, p. 153). The exploration of uncharted coasts and seas, feared dwelling of all kinds of sea monsters and other mythical creatures, led to the discovery of the Atlantic archipelagos of Madeira and of the Azores. Sailing further South and West, the coast of Africa and eventually Brazil were added to the charts and, in May 1498, the Portuguese, led by Vasco da Gama, reached India by sea. Regular commerce with Africa, South America and Asia (where Portugal held at one time, the monopoly of trade between China and Japan) ensued until the 17th century (Page, 2002, Levenson, 2007)[16].

The Portuguese held, since 1454, the monopoly "on maritime expeditions, shipping and trade", granted by Pope Nicholas V (Carvalho *et al*., 2015, p. 153). Forty years later, in 1494, the Portuguese and Spanish kingdoms negotiated the Treaty of Tordesillas with the Vatican (Pope Alexander VI). The treaty established a meridian line 1,184 nautical miles west of Cape Verde: all discoveries eastward of the line would be for the Portuguese to conquest and Christianize; everything westward, to Castile (Marques Guedes, 2012). The treaty became "the first legal framework applicable to navigation in the South Atlantic" and limited "all European activity south of the Tropic of Cancer to Portuguese and Castilian endeavours for the best part of a century" (Marques Guedes, 2012, p. 14)[17]. In so doing, the treaty

[15] More information on this text can be found online on the following websites: Ciberdúvidas da língua Portuguesa (https://ciberduvidas.iscte-iul.pt/outros/antologia/da-minha-lingua-ve-se-o-mar/2425); Instituto Camões (http://cvc.instituto-camoes.pt/oceanoculturas/22.html) and European Commission (http://europa.eu/rapid/press-release_IP-91-902_en.htm). Accessed on 8.9.2016.

[16] A feat summarized by Camões, in "Os Lusíadas", his 1572 epic poem lauding the Portuguese maritime history, as: "giving new worlds to the world".

[17] The Treaty of Tordesillas effectively accounts for the distribution of languages still spoken today in Latin America, as Brazil, the only Portuguese speaking nation in this otherwise Spanish speaking subcontinent, fell eastward of the line (Marques Guedes, 2012).

established "the doctrine and legal practice of *Mare Clausum*[18]", later challenged by the *Mare Liberum* principle postulated by Hugo Grotius in 1609 "to justify the interests and policies of Dutch traders and trade companies" (Romero Magalhães, 2015, p. 95). In the course of the next centuries, many coastal nations developed a growing interest in securing rights over the seas fringing their territories (called "territorial seas", extending usually up to three nautical miles), and the natural resources within. States attempted to expand their national jurisdictions over ever-increasing areas of the sea and seabed, some even laying claim to a 200 nautical mile zone (Bollmann *et al.*, 2010). Four Geneva conventions on the Law of the Sea were adopted in 1958 – they are unified today, and expanded, under the United Nations Convention on the Law of the Sea (UNCLOS), adopted in 1982 (*ibid*.).

In 1993, Portuguese diplomacy led by Portuguese President Mário Soares as head of the Portuguese delegation to UNESCO's Intergovernmental Oceanographic Commission (IOC), proposed the proclamation of 1998 by the UN as the International Year of the Ocean (Costa Fernandes, 2008; Pitta e Cunha, 2011), on the occasion of the 500th anniversary of the arrival of Vasco da Gama to India. Despite the resistance of several nations to this proposal, fatigued by the lengthy discussion of UNCLOS, and some afraid that additional global attention to ocean affairs might further thwart freedoms of navigation and of access to riches in the ocean, Portuguese diplomacy was able secure that proclamation (Pitta e Cunha, 2011). In so doing, Portugal managed to frame the theme of the Lisbon 1998 World exhibit (EXPO'98), "The Oceans, a Heritage for the Future", within the UN's own ocean agenda (UNESCO, 1997), and use the exhibit as a "launching pad to promote a new agenda for the Oceans in the United Nations" (Pitta e Cunha, 2011, p. 36).

In 1995, again under the leadership of Portuguese President Mário Soares, the Independent World Commission on the Oceans (IWCO) was established "to develop world-wide consciousness of the unique role of the oceans for planetary survival, encourage development of the United Nations Convention on the Law of the Sea, examine the economic potential of the oceans, and contribute to other ocean-related issues" (UNESCO, 1996). IWCO was expected to contribute with much needed political action to promote solutions for the oceans well-known problems (*ibid*.). The IWCO's final report "The Ocean,

[18] The *Mare Clausum* concept was developed by English scholar John Selden (1584-1654) (Bollmann *et al*., 2010).

Our Future" (IWCO, 1998), was presented to UN's Secretary General, Kofi Annan, during EXPO'98, together with the 1998 Lisbon Declaration: Ocean Governance in the 21st century – Democracy, Equity and Peace in the Ocean. These documents provided an overview of the main issues related to ocean sustainability, advocating a holistic approach for improving global ocean governance, and significantly contributed to forward the ocean agenda at the national and international level (Pitta e Cunha, 2011; Ruivo *et al.*, 2015).

In 2006, in the framework of the OSPAR convention, Portugal successfully negotiated the creation and management of a marine protected area (MPA) for the protection of the hydrothermal vent field "Rainbow", which became the first national MPA proposed under the high seas (Ribeiro, 2010).

Portugal contributed directly to the development of the policy framework for Europe's maritime territory, namely in the formulation of the Green Paper (Resolution of the Council of Ministers 163, 2006) which anticipated the EU Integrated Maritime Policy (IMP) (CEC, 2007). The IMP was an initiative of the President of the European Commission, the Portuguese Durão Barroso at the time, and was adopted by the European Commission in Lisbon in 22 October 2007, under the Portuguese Presidency of the European Union (European Commission, 2007; Ruivo *et al*., 2015). It also directly contributed to the onset and development of the European Union Maritime Strategy for the Atlantic Ocean Area (MAMAOT, 2011). The strategy was launched by European Commissioner Maria Damanaki in 2011 during the Lisbon Atlantic Conference (European Commission, 2011), where the concept of Lisbon, Portugal's capital, as the "Atlantic capital of Europe" (Vasconcelos & Reis, 1997), regained momentum (Governo de Portugal, 2011)[19]. The approval of the action plan for the EU's Maritime strategy for the Atlantic Ocean Area, took place at the second Lisbon Atlantic conference (Ruivo *et al*., 2015).

Clearly, Portugal has had a determining role in forwarding an international agenda for the oceans, both at the global level and at the regional scale of the European subcontinent. Internally, significant attention was also being given to the Ocean. In 1998, during EXPO98, one meeting of the Portuguese Council of Ministers especially dedicated to the Ocean, yielded various resolutions pertinent to the promotion of ocean policy in

[19] The Portuguese minister of the sea, started her speech in this event with Vergílio Ferreira's words "From my language, one can see the sea" (MAMAOT, 2011).

Portugal. Resolution of the Council of Ministers 83/98 stated the Government's "firm intention" to "create favourable conditions and take necessary measures to make Portugal's return to the sea, at the turn of the millennium, a true national project" (Resolution of the Council of Ministers 83, 1998, p. 3255). This resolution "formulated guidelines for the development of a national maritime strategy based on UNCLOS and other relevant instruments" (Ruivo *et al.*, 2015, p. 351-352), and established the date of 16th of November as national day of the sea, in celebration of the day of UNCLOS' entry into force in 1994 (Resolution of the Council of Ministers 83, 1998, p. 3255).

2.3. Redrawing the nation's borders

Portugal's terrestrial borders are the oldest political limits in Europe, estimated to have been stabilized as far back as 1249 (Amaral & Garcia, 1998). On the sea side, only in 2006, in the framework of UNCLOS, Portugal enacted a law determining the extent of the maritime zones under national sovereignty or jurisdiction and of Portugal's powers over that territory and in the high seas (Law 34, 2006). The total areas of interior maritime waters, territorial sea and exclusive economic zone for the three national regions (mainland, Archipelago of Madeira, and Archipelago of the Azores), are summarized in table 2.1.

Table 2.1. Areas of interior maritime waters, territorial seas and exclusive economic zones of Portugal's mainland and of the Archipelagos of Madeira and the Azores, according to Bessa Pacheco (2013). Values in km^2.

	Mainland	**Madeira**	**Azores**	**Total**
Interior waters	6,508	825	6,064	13,397
Territorial sea	16,460	10,834	23,663	50,957
EEZ	287,521	442,248	930,687	1,660,456
Total	310,489	453,907	960,414	**1,724,810**

This maritime area of over 1,700,000 km^2 corresponds to about 41% of the total marine waters of the EU (and 48% of its volume) (MAM, 2014) and is identical in size to the EEZs of the East and West coasts of the U.S. (Sea Around Us Project, 2013).

In 2005, a task force had been created to delimit the extent of the continental shelf beyond 200 nautical miles, in accordance with the provisions of UNCLOS (Resolution of the

Council of Ministers 9, 2005). The proposal was submitted to the United Nations Commission on the Limits of the Continental Shelf (CLCS) on 11 May 2009 (CLCS, 2015), and it still awaits consideration. If accepted with no further requirements by the CLCS, it will add another 2,100,000 km^2 to Portugal's maritime area (Figure 2.1.).

As such, the vast majority of the Portuguese territory is maritime, being approximately 18 times bigger than its terrestrial dimension (from 0-200 NM), and c. 40 times larger when the area of the extended continental shelf is included (Resolution of the Council of Ministers 12, 2014).

Thus, despite being a relatively small country in terms of its terrestrial area (c. 92,000 km^2), Portugal is one of the European Union's largest maritime nations. Portugal's renewed maritime dimension, "with its massive presence in the North Atlantic" brings about a significant modification in "the correlation of strength between States" (Suárez de Vivero & Rodríguez Mateos, 2014, p. 68).

On a worldwide scale, Portugal's projected maritime dimension will encompass c. 4% of the Atlantic Ocean and 1% of the global Ocean, making Portugal one of the world's largest maritime nations (Bessa Pacheco, 2013; Resolution of the Council of Ministers 12, 2014). The country's geographic position, peripheral in the framework of the European landmass, but ultra-central in terms of its maritime domain, gives it a unique geostrategic position between Europe and the rest of the world (Resolution of the Council of Ministers 12, 2014; Suárez de Vivero *et al*., 2015).

Portugal's maritime space, including the seafloor and subsoil, are potentially rich in living and non-living resources. Deep-sea organisms, including unicellular bacteria and archaebacteria, but also sponges and other invertebrates, have unique biomolecules with potential biotechnological applications in various types of industries: health foods, pharmaceuticals (including disease fighting drugs, but also cosmetics), optical commutators and photonic electric generators, detergents, etc. (Gonçalves *et al*., 2015).

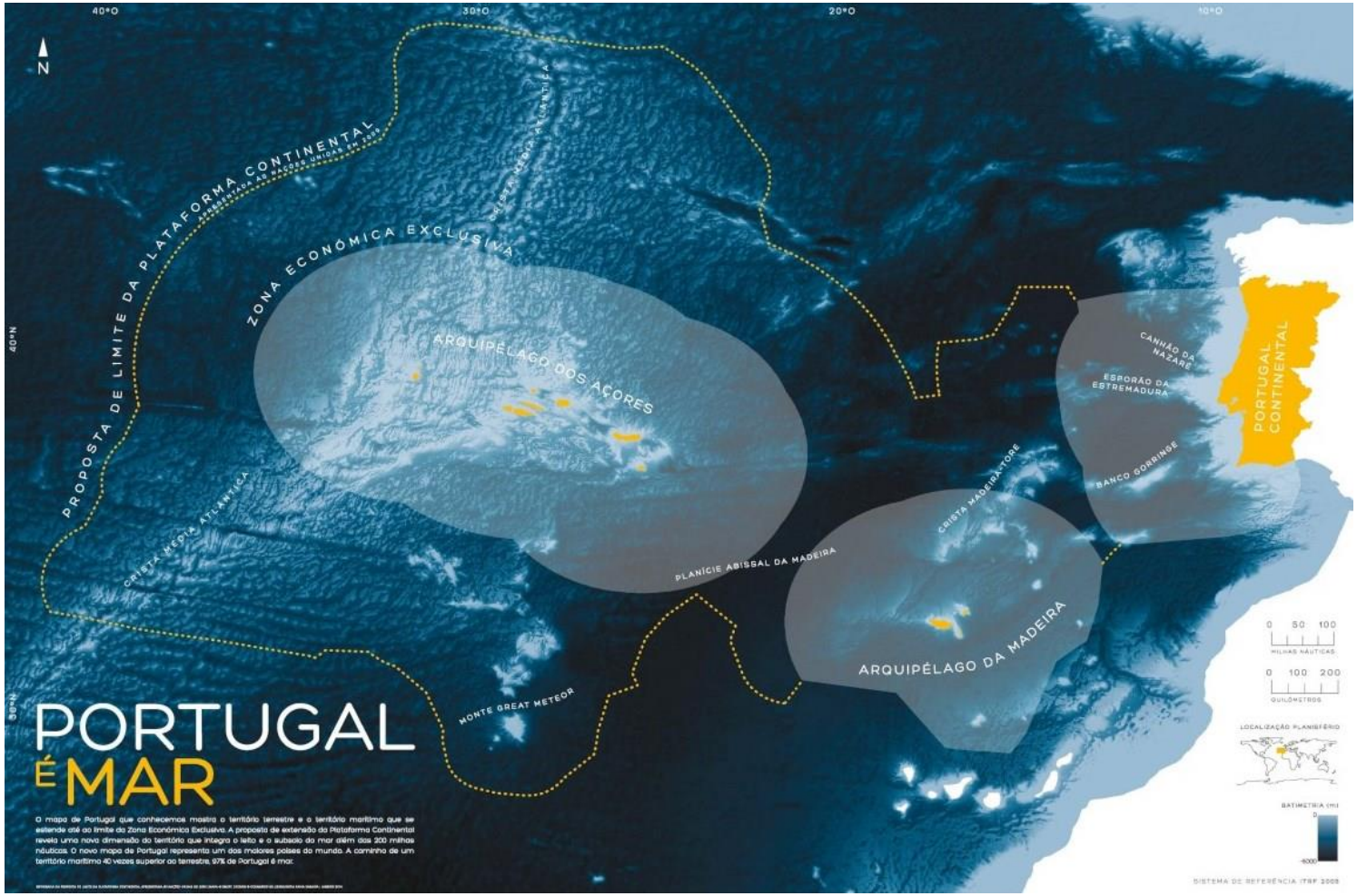


Figure 2.1. Portugal's national maritime space (mainland, Madeira and Azores). Shaded areas represent the territorial sea and Exclusive economic zones. The dotted yellow line is the limit of the proposal for the extension of the continental shelf, presented by Portugal to the United Nations in 2009. (Map source: http://kitdomar.emepc.pt/outros-mares/mapa-portugal-e-mar/).

Deep sea geological resources include deposits of massive sulphides (associated with hydrothermal fields), polymetallic nodules and crusts (the former found loose on the seabed, the latter firmly attached to the rocky substrate) containing primarily manganese and iron oxides, but also other types of metals, including cobalt, nickel, copper and even rare earths and platinoids (*ibid*.). In view of such prospects (Figure 2.2.), interest in the exploitation of this maritime territory is growing.

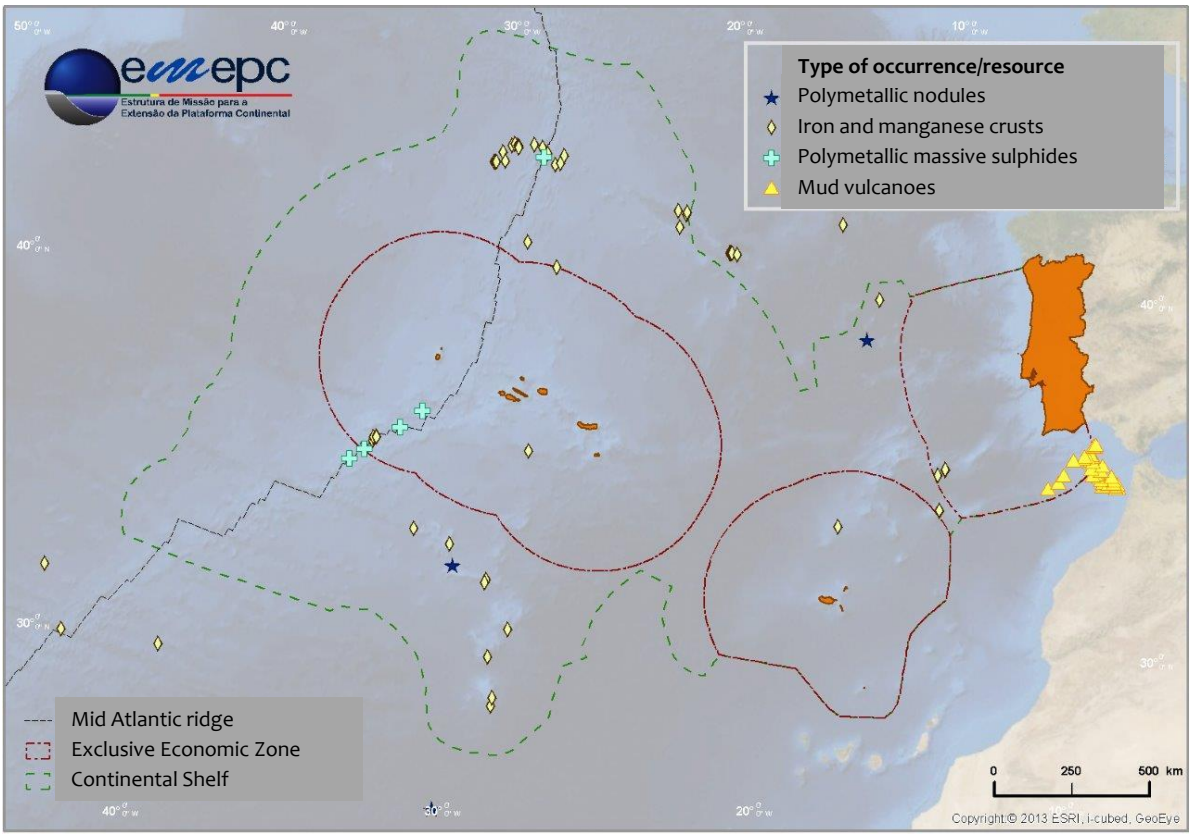


Figure 2.2. Estimated distribution of marine mineral resources in the NMS (EMEPC, 2014).

However, this expansion over the maritime space, effectively changing the country's territorial basis, not only adds "territorial capital in the form of 'living spaces' that enable states to grow organically (…) but also areas where territorial tensions and conflicts are engendered and, as such, new arenas of political instability" (Suárez de Vivero & Rodríguez Mateos, 2017, p. 23)

2.4. Portugal's MSP framework

While Portugal's maritime dimension remains out of sight (and out of mind) for the majority of the Portuguese population, the national framework for ocean planning and management has been developed over the last decade, along with developments in the international and European arena (Frazão Santos *et al*., 2014). In 2006, Portugal approved a first National Ocean Strategy – NOS 2006-2016. Although it included strategic actions and measures, it did not propose an action plan or a matrix of indicators to assist in its implementation and subsequent evaluation (Resolution of the Council of Ministers 12, 2014). In 2008, the first Portuguese Maritime Spatial Plan (POEM – *Plano de Ordenamento do Espaço Marítimo*) was set in motion. It was developed only for the EEZ of the mainland, and encompassed the domains of geostrategy, economy, natural resources, knowledge and governance (MAOT, 2010)[20]. After a period of public consultation, in November 8th, 2012, a governmental ruling classified the POEM as a study and determined that its elements should be made available online and be updated as necessary (Ruling 14449, 2012). In 2010, Portugal transposed the MSFD into national law, and has since been actively committed to its implementation, with the development of four marine strategies and of the monitoring and measures programmes required by the directive.

Since 2014, a new national legal framework for marine policy has progressively been established. This comprises:

- **National Ocean Strategy 2013-2020 (NOS 2013-2020)** and its associated action plan (Plan Mar-Portugal) published in February 2014 (Resolution of the Council of Ministers 12, 2014);
- **National Law establishing the Basis of the Policy for Marine Spatial Planning and Management of the National Maritime Space (MSPM Law)**, published in April 2014, (Law 17, 2014); and
- **Decree-Law developing important aspects of the implementation of the MSPM Law and transposing the EU's Maritime Spatial Planning Directive (Decree-Law 38/2015)**, in March 2015 (Decree-Law 38, 2015).

[20] For a thorough discussion of the POEM cf. Calado & Bentz, 2010; Frazão Santos *et al*., 2014b; Frazão Santos, 2016.

The national MSPM system thus created comprehends different levels of policy instruments, from the strategic level of the NOS 2013-2020, to the operational level of marine spatial plans. Each of these instruments is presented in more detail below.

National Ocean Strategy 2013-2020

In 2013, due, *i.a.*, to the new European maritime policy landscape, the NOS 2006-2016 was reviewed and updated. The new National Ocean Strategy 2013-2020 (NOS 2013-2020) and its associated action plan (Plan Mar-Portugal), published in 2014, adopted blue growth as its development model, and defined the following objectives (abridged) (Resolution of the Council of Ministers 12, 2014):

i) To reaffirm the national maritime identity in a modern, proactive and entrepreneurial framework;

ii) To turn the Mar-Portugal into an asset with permanent economic, social and environmental benefits;

iii) To create conditions for attracting national and international investment, in all Ocean economy sectors, promoting growth, employment, and the sectors' growth in the national GDP in around 50% by 2020;

iv) To stimulate the development of new areas of action (science, technology) that promote knowledge about the Ocean and effectively, efficiently and sustainably enhance its resources, use and activities as well as its ecosystem's services;

v) To consecrate Portugal as a maritime nation, as a part of the IMP and of the EU maritime strategy, in particular for the Atlantic area.

Marine Spatial Planning and Management Law

In 10 April 2014, a law establishing the policy basis for the spatial planning and management (MSPM Law) was published. Its ultimate stated aim is to contribute "to the country's sustainable development" (Law 17, 2014, p. 2358). The guiding principles of national MSPM, listed in the law are (abridged): ecosystem approach; adaptive management; integrated, multidisciplinary, and transversal management; valorisation and promotion of economic activities in the long-term; and regional and cross-border cooperation and coordination (*Ibid*.). Objectives of MSPM were stated in Article 4:

1. (…) the promotion of economic exploitation, sustainable, rational and efficient, of marine resources and ecosystem services, ensuring the compatibility and sustainability of the diverse uses and of the activities developed therein, considering the responsibility, inter and intragenerational in the use of the national maritime space and aiming at job creation.
2. (…) actions developed in [this] framework (…) must attend to the preservation, protection and recovery of natural values and coastal and marine ecosystems and to achieving and maintaining good environmental status of the marine environment, as well as to risk prevention and the minimization of the effects resulting from natural disasters, from climate change or from human action.
3. (…) actions developed in [this] framework (…) should ensure legal certainty and the transparency of the attribution procedures of the titles for private spatial use and allow for the exercise of the information and participation rights provided for in this law.
4. (…) use the information available on the national maritime space.
5. (…) prevent or minimize possible conflicts between uses and activities carried out in the national maritime space.

The MSPM Law applies to the national maritime space (NMS), which encompasses the water column, the seabed and its subsoil from the baseline, on the land side, to 200 nautical miles (NM) offshore, the outer limit of the Portuguese Exclusive Economic Zone (EEZ), and, thence, the seabed and subsoil to the outer limit of the continental shelf beyond 200 NM (Law 17, 2014). The MPSM law was the first Portuguese legal instrument to encompass the entire NMS and to integrate its environmental, social, and economic dimensions (Becker-Weinberg, 2015; 2016).

The MSPM Law created the national system for MSPM, which includes two types of instruments: strategic policy instruments (namely, the National Ocean Strategy), and spatial planning instruments – situation plans and allocation plans.

Decree-Law 38/2015

Decree-Law 38/2015 published on 12 March 2015, established rules for the application of the MSPM Law (including the framework for future developments), and transposed the EU MSP Directive to the national legal framework (Decree-Law 38, 2015). It stated the objectives of future Portuguese MSP instruments (*ibid.*, p. 1526):

a) To implement the objectives of strategic development established in the strategic instruments of the spatial planning and management of the national maritime space, namely in the National Ocean Strategy;
b) To promote the economic exploitation, sustainable, rational and efficient of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change;
c) To align (order) the uses and activities to be developed in the national maritime space taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment;
d) To prevent or minimize eventual conflicts among uses and activities developed in the national maritime space;
e) To ensure legal certainty and transparency of the procedures entrusting the rights of private use in the national maritime space;
f) To ensure the use of available information on the national maritime space.

Next, aspects of the Decree-Law related to the situation and allocation plans and to the consideration of existing uses and the evaluation of alternatives are highlighted.

Situation Plan

The situation plan "represents and identifies the spatial and temporal distribution of existing and potential uses and activities, and identifies the natural and cultural values of strategic relevance for environmental sustainability and intergenerational solidarity" (Article 9(1)). It encompasses the entire NMS (Article 9(2)). Decree-Law 38/2015 stipulated that the

situation plan will "identify the spatial and temporal distribution of existing and potential uses and activities", listing specifically (Article 10(1)):

i. aquaculture and fishing, when associated with a structure built for that effect;

ii. marine biotechnology;

iii. marine mineral resources;

iv. energy resources and renewable energies;

v. scientific research;

vi. leisure, sports and tourism;

vii. underwater cultural heritage;

viii. infrastructure.

The situation plan will also indicate areas and/or volumes important for nature, biodiversity and ecosystem services conservation, national defence infrastructures, and cultural values, and identify navigation lanes, dredging and dumping grounds, submarine cables and pipes, port facilities and coastal defences, emerged shallows, artificial islands and reefs, and location of shipwrecks (*ibid*.). The situation plan may or may not be subjected to Strategic Environmental Assessment (SEA) and such a decision is incumbent on the government member responsible for sea affairs (Articles 12 and 13).

Allocation Plans

Allocation plans "allocate areas and or volumes of the NMS to uses and activities not identified in the situation plan, setting out, where applicable, the respective use parameters." (Article 19(1)). Once approved, allocation plans are automatically integrated in the situation plan, which is automatically amended for that purpose (Article 19(2)). Allocation plans include the characterization of the corresponding area or volume of the NMS, the identification, description and spatial/temporal distribution of uses and activities to be developed therein, and implementation rules (Article 20). Allocation plans are considered projects and may be subject to Environmental Impact Assessment (EIA) (Article 23(1)) in the terms of EU's EIA Directive (OJEU, 2011).

Private use of the NMS

The NMS is of "common use and fruition, namely for leisure" (Article 46(1)). The possibility to privately use the NMS[21] is subject to a private use title (Table 2.2).

Table 2.2. Private use titles of areas or volumes of the NMS.

Type of title	Use	Max. Duration	Fee
Concession	Prolonged use (uninterrupted use >= 12 months)	50 years	Yes
License	Temporary (<12months), intermittent, seasonal use	25 years	Yes
Authorization	Applied scientific research; pilot projects for new uses/technologies or; non-commercial activities	10 years	Exempted

A private use title obligates its holder to an effective use, as defined in the allocation plan, and determines the duty to adopt, at all times, measures for achieving/maintaining good environmental status (GES) of the marine environment, in accordance with the MSFD, and good status (GS) of coastal and transitional waters, in accordance with the Water Framework Directive (OJEU, 2000). Upon the extinction of the title, the holder is obligated to "…restore modified *physical conditions that do not result in a benefit*." (Article 48(4) (emphasis added)).

Private use fee of the NMS

A private use fee (TUEM) of the NMS is established to compensate for: the private use profit resulting from the occupation of an area or volume of the NMS; the environmental cost inherent in the activities liable to cause significant impact on the NMS; and the administrative costs of spatial planning, public management, maritime safety, maintenance and inspection. TUEM is calculated as the sum of A+B+C, where *A* corresponds to the occupied area or volume of the NMS, *B* expresses the effects of uses susceptible to cause significant environmental impact and the need to ensure monitoring and to ensure GES, and *C* corresponds to needs for maritime safety services, monitoring systems, and their maintenance, inherent in the occupation of the NMS (Article 78).

The "TUEM applies to all uses or activities which imply the private use of the NMS" (including concessions or licenses, but exempting authorizations from such payment)

[21] Any use requiring reservation of an area or volume to a use of the environment or marine resources or ecosystem services superior to one obtained by common use and which results in a benefit (advantage) to the public interest. *Ibid*., at Article 47.

(Article 76(1)). However, the "TUEM does not apply to the private use of the NMS for the exploration and exploitation of geological and energy resources" (Article 76(2)). It is stipulated that a proportion (37.5%) of the TUEM value will be applied to fund activities to improve MSPM and the GES of the NMS and coastal/transition waters, and to fund and maintain maritime security services and monitoring systems (Article 86).

Other financial guarantees, such as the need for the holder of a private use title to pay a deposit and insurance, are provided for. The holder of a private use title is liable for all losses caused by structures related to the title. In the case of concessions or licenses, the title holder is required to pay a deposit to ensure the maintenance of biological, physical and chemical conditions of the marine environment and the removal of mobile structures installed. Upon termination of the title, the deposit is returned after the holder restores altered environmental conditions which do not translate into a benefit to the marine environment and removes related constructions, except when the public benefit of their maintenance exceeds that of removal. Payment of a deposit can be waived when the use or activity is not likely to alter pre-existing environmental conditions. Title holders must also secure liability insurance to ensure the obligation to pay compensation to cover any damage to third parties (Articles 66-67). Liability insurance does not make reference to environmental liability.

Existing vs. potential uses or activities

Existing uses or activities are "those being developed under a private use title of the NMS," whereas "potential uses or activities" are "those identified as liable to be developed in the areas and or volumes identified in the situation plan, to which a private use title has not yet been attributed" (Article 9(3)).

Conflicting uses or activities

To assist in the determination of a prevailing activity, when comparing existing or potentially conflicting uses or activities, the following preference criteria should be used (provided that biodiversity values and the GES of the marine environment and GS of coastal/transition waters are guaranteed) (Article 27):

a) Greater social and economic benefit (advantage) to the country; and

b) Maximum coexistence of uses or activities[22].

The first criterion is to be evaluated according to the following parameters, each with equal weighting, preference being given to the use or activity with the highest score:

a) Number of jobs created;

b) Qualification of human resources;

c) Volume of investment;

d) Economic viability of the project;

e) Forecasted results;

f) Contribution to sustainable development;

g) Value creation;

h) Expected synergies in related activities; and

i) Social responsibility of interested parties in the development of the use or activity.

Since preference for a given use/activity may imply relocation of existing uses/activities (ideally to a nearby, comparable location), should such relocation be due to environmental reasons, the cost of this relocation is supported by the Portuguese State (Articles 28 and 29).

Transitory dispositions

Until the adoption of the situation plan, the POEM is considered the reference situation for the marine spatial planning of the NMS and for the allocation of new private use titles (Article 104(1)). Instruments for the protection and preservation of the marine environment that have been approved by the governments of the autonomous regions (Madeira and the Azores) prior to the Decree-Law, will be taken into consideration when approving or amending the situation plan. However, in the case of a substantiated need to safeguard national interests, when approving or revising MSP plans, the national government may determine the total or partial non-integration, or the exclusion of such instruments (Article 104(4)).

[22] When the first criterion doesn't apply or when conflicting uses and activities are equally valued under it.

2.5. An analysis of Portugal's MSP framework

This section includes an analysis of Portugal's MSP framework, based on two distinct studies conducted as the legal framework was being developed (Ferreira *et al.*, 2015; 2015b). The first was based on perceptions of U.S. MSP practitioners (cf. justification for the choice of the U.S. vs. other international experiences in the *Introduction* section), drawing from their practical experience to highlight challenging aspects in the real-world implementation of MSP, and to reflect on how such aspects are being considered in the Portuguese legal framework and how they can be improved, to promote better implementation. Drawing from the U.S. MSP experience, aspects related to the incorporation (or not) of existing uses in MSP processes, and criteria deemed relevant in an analysis of alternatives were researched (Ferreira *et al.*, 2015). The second analysis presents results of an expert conference held at FCSH/UNL in January 2015 to debate the developing Portuguese legal framework (prior to the publication of Decree-Law 38/2015). The main objective of this expert debate was to contribute constructively to the legal framework, while it was still being developed, by offering suggestions to improve aspects, which, in the experts' understanding constituted weaknesses or threats to optimal implementation (Ferreira *et al.*, 2015b).

Insights from the U.S. marine spatial planning experience

As a first attempt to understand potential implications of the implementation of the Portuguese legal framework for MSP, a parallel was sought with the international experience, to derive insights that might be useful in for the Portuguese case. A mixed methodology was used, which included: i) a review and analysis of online and paper information (plans, technical reports, guides, public information documents) pertinent to federal and state-wide initiatives on MSP in the U.S.; ii) interviews to gather new data on the unwritten perceptions of MSP practitioners concerning MSP processes in the U.S.. The primary focus was on the three U.S. states most advanced in their respective MSP processes, *i.e.*, Massachusetts, Rhode Island and Oregon. Practitioners from Washington state and California were also interviewed.

A list of interviewees was derived from key informants who could represent diverse marine stakeholder perspectives involved in their respective MSP processes: state agencies, local governments, academia, non-governmental organizations (NGOs), and other

stakeholders, including but not limited to the commercial fishing industry. Twenty-one semi-structured interviews were conducted (Table 2.3.) per standard social science protocol.

Table 2.3. Categories and numbers of stakeholders interviewed.

Coast	State	Stakeholder group	# interv.	Total
West	Oregon, Washington, and California	Fishing Industry	6	17
		State agencies	7	
		Local government	2	
		Academia	2	
East	Rhode Island and Massachusetts	State agency	2	4
		Academia	1	
		Private-public partnership	1	

The interviews were designed around a list of topics related to the MSP process, focusing on: (a) drivers of the process, (b) consideration given to new and existing uses, and (c) aspects related to the evaluation of alternatives. Open-ended questions were emphasized. It was assumed that the interviewees would guide the discussion towards topics of genuine concern. Research results include stakeholders' impressions or perceptions without determination of accuracy. Interviews took place in person or by telephone between May and July 2013. All interviews were recorded (contingent on participants' permission) to enhance accuracy and completeness of the data record and later analysed for content.

In the U.S., marine jurisdiction is shared between states (with few exceptions, out to three NM) and the federal government (from three to 200 NM off shore). For many years, the federal government has been engaged in mapping federal waters, and in the early 2000s it became involved in promoting and developing sound MSP as a policy for wise sea use and conflict reduction. Because 35 American coastal states manage their jurisdictional waters, it is up to each one to develop its own MSP process and final plan.

Drivers of U.S. MSP Processes

Two main drivers for the beginning of formal MSP processes in the U.S. were identified by research participants: a growing focus on the development of offshore wind technologies and marine renewable energies, and the Obama Administration's National Ocean Policy (White House, 2010).

Marine Renewable Energy (MRE)*:* MRE projects include offshore equipment arrays for harvesting kinetic energy from wave, wind, tidal, and current sources. Prospects for, and concern with, the development of MRE projects were the main drivers identified by all but one of the research participants for the onset of MSP efforts in the U.S., a notion confirmed in plan documents and related literature (Commonwealth of Massachusetts, 2009; McCann *et al*., 2013; OCMP, 2013; Pomeroy *et al*., 2015; RICRMC, 2010). In the early 2000s, various MRE companies filed applications for exploratory permits in the territorial seas (to 3 NM) and federal waters off Massachusetts and Rhode Island, Oregon, California, and Washington. East Coast development proposals concerned offshore wind energy, and several applications for wave and tidal energy projects were filed for West Coast waters (Campbell, 2009; Husing, 2011). The prospect of job creation generated by MRE projects was referred as another factor that influenced state governments to promote such projects. The majority of practitioners from the West Coast mentioned the sense of "a gold rush" on the ocean, also referred to in the literature,[23] stemming from the number of permits applied for by MRE companies before any jurisdictional and permitting procedures for MSP were in place (Campbell, 2009). One state agency representative summarized it as "it was the 'wild West' all over again" and one local government representative noted: "At this time the only thing protecting the Ocean, is the Ocean herself".

National Ocean Policy (NOP): The NOP, particularly the Interagency Ocean Policy Task Force Final Recommendations (CEQ, 2010) and Implementation Plan (NOC, 2013) and the Guide for Regional Marine Planning (NOC, 2013b), were the second most-mentioned drivers for MSP initiatives in the U.S. states considered. The NOP identifies Coastal and Marine Spatial Planning (CMSP) as one of nine national priorities. According to research participants, this "tide of evolving thinking in the U.S." and the notion that "people felt threatened because they didn't want to be managed from Washington D.C.", led state governments and agencies to try to figure out what the implications of the NOP would be

[23] For Conway and co-authors (2010), the ocean has "in many ways, become valuable 'real estate'", and "fights over space resemble those of land-grant claims and the gold rush" (p. 82); cf. also Husing, 2011; Concerns about emerging marine industries such as deep-sea mining yielding "an underwater gold rush" have also been voiced in the press. Cf. Miner, 2013.

for their state and to start their MSP efforts, in an attempt to set a precedent for what the federal government could or could not do at state level[24].

Protection of existing uses in U.S. MSP

The protection of existing uses is a priority stated in U.S. MSP instruments. Massachusetts Ocean Management Plan goals contemplate supporting "wise use of marine resources, including renewable energy, sustainable uses, and infrastructure," which includes the minimization of "conflicts with/impacts to existing uses and resources" and, specifically, the development of measures "for reconciling use conflicts with fisheries" (Commonwealth of Massachusetts, 2009, p. 1-4). Rhode Island's Ocean Special Area Management Plan (RI SAMP) lists the promotion and enhancement of existing uses as one of its four goals, second only to fostering "a properly functioning ecosystem that is both ecologically sound and economically beneficial" (RICRMC, 2010, p. 1-6). Oregon's enforceable Territorial Sea Plan (TSP), requires renewable energy facilities by law to "minimize the potential adverse impacts to existing ocean resource users and coastal communities" (OCMP, 2013, p.1). This reflects the requirements of the state's overarching ocean management goal, established in 1973, which places the highest priority on the vitality of the marine ecosystem and includes protection of existing "beneficial uses of ocean resources — navigation, food production, recreation, aesthetic enjoyment, and uses of the seafloor — provided that such activities do not adversely affect the [living marine] resources" (ODLCD, 2010, p.73). As one state agency representative explained, "existing beneficial uses are economic drivers." At the Federal level, the implementation plan of the NOP states that proposed actions are meant to "help maintain existing jobs and promote job growth" and "supporting existing and new marine industries, maintain and enhance the vitality of coastal communities and regions, and preserve the marine ecosystems that support our quality of life" (NOC, 2013, pp. 6,7).

However, despite written intentions, concerns were voiced during the interviews that there is a greater focus on job creation than on preserving existing jobs that sustain local and regional economies, which may endanger the livelihoods of coastal communities. One consideration shared by one West Coast participant summarizes this concern:

[24] These comments' characterization of the division of duties and responsibilities between Federal and state management and law is inaccurate, and capture the misunderstandings, fear, and high emotions of the time. Federal law requires the federal agency in charge to defer to, and follow, a coastal state's comprehensive plan (for example, Oregon's legally enforceable land use planning, TSP, and Coastal Management Plan.)

"(agencies) are used to regulating jobs and putting conditions on existing uses, but they're not used to protecting jobs". Many participants expressed concern with fisheries, believed to be particularly sensitive to the encroachment of new activities, particularly those requiring the installation of permanent structures. One state agency representative recalled: "the fishing industry has been here from the beginning, then shipping came and took its toll, then recreation, and building ports, and now marine energies... it's what we call death by a thousand cuts!"

Non-consumptive recreational ocean users (surfers, boaters, and wildlife viewers) are another ocean stakeholder that can be affected by incoming uses. Eardley and Conway (2011) studied this community in Oregon, and highlighted its importance in sustaining local economies. Their study showed that these generally overlooked existing uses may be directly affected by new activities, either by altered physical conditions, restricted access or depreciated seascapes, which may result in the relocation of existing uses, hindering the local economies (existing jobs) they help sustain.

Need for full cost-benefit analysis of alternatives in U.S. MSP

Although recognizing a pressing need to find alternative energy sources to oil and gas, concerns were consistently voiced about MRE projects, namely uncertain markets, due to the estimated costs of these energies compared to existing energy sources, and uncertainty about the technological development of MRE, as the technology is generally perceived as "not being quite there yet" and as not being a viable alternative at this point to existing energy sources. There was a generalized concern that, despite these uncertainties, administrations and agencies tend to accept the promises made by promoters without critical examination. One interviewee summarized this as being co-opted by false promises of economic interests and explained: "(agencies) have been promised by promoters that this will be a great industry, it will produce all these jobs, and do all this wonderful stuff for the state, clean the air and everything, but they haven't done a critical analysis to really determine if the claims that are being made are true and realistic."

For these reasons, practitioners highlighted the importance of a full cost-benefit analysis of MRE projects to ensure that individual/private interests and profit do not override public benefits and the public interest. According to research participants, this full

cost-benefit analysis of alternatives should include a careful estimation of (Ferreira *et al*., 2015):

- *Maintenance costs*: The "staggering" cost of maintaining devices in sea water was repeatedly mentioned, especially by those related to the fishing industry. "There's nothing harsher, maybe outside of outer space, when it comes to devices in the ocean" and "anything steel in the ocean needs to be maintained, you can't just put it out there and say it's gonna last for 20 years"[25]. Many questioned how and if such maintenance costs will add to the cost of the electricity produced and if they are being adequately considered in the financial viability analysis;
- *Removal and restoration costs:* Despite being required to ensure restoration of pre-project conditions once projects are over, promoters are perceived as resisting the need to fully remove devices and do remediation. Various practitioners voiced this concern: "Once these things are in the water, I don't care what they say, they're not getting them back up." Another participant explained: "They never get enough money to do the clean-up: it's more expensive to pick up one of these devices up in deep water than it is to put them in." The general concern can be synthesized by the comment of another participant: "These companies, once they go bankrupt, they're out of here, and you (the public) are left holding the damage";
- *Displacement costs/loss of jobs:* The installation of permanent/fixed devices is seen as having the potential to displace existing uses and activities and to result in increased security issues and ultimately in loss of jobs, affecting well-established and economically productive sectors. One state official remarked that "(government) doesn't necessarily understand that there's a lot of existing users, who are preserving jobs and economies by their use of a certain space, and with the decision to exploit that same space they may be hurting one economy while they're trying to enliven another one";
- *Distribution of revenues:* This was referred to as a major concern, especially when public benefits are spread over a broader range of stakeholders and are therefore more difficult to perceive or account for. Practitioners spoke to the importance of

[25] (cf. Mueller & Wallace, 2008)

carrying out a full analysis of the distribution of revenues (value creation) from current and prospective uses. The most common example was that of fisheries and related processing industries, estimated to yield millions of USD in revenues yearly. One research participant alluded to a common lack of attention being given to the synergies from activities related to fisheries as "the ocean produces tremendous amounts of food, but because it (the economic revenue) is spread out over so many people, it is overlooked. Food is just as important as electricity, but people don't see it that way."

- *Aesthetic costs:* participants were concerned that the installation of permanent devices in the water may lessen the aesthetic value of the ocean seascape and stressed that people on the coast do not want projects (and the structures that come with them) to depreciate the value of their seascape: "we don't want our views ruined by these things" and "for coastal people the ocean is their greatest asset".[26] This relates directly to the protection of existing uses referred above.

Parallel with Portugal: Drivers of the MSP process

The focus of Portugal's legal framework for MSPM and the NOS 2013-2020 restate EU priorities for the ocean, namely "Blue Growth". In fact, the stated objective of the 2014 MSPM Law is "*the promotion of economic exploitation* (…) of marine resources and ecosystem services, (…) *aiming at job creation*." (Law 17, 2014, Article 4(1); emphasis added). Concrete prospects for the exploitation of renewable energies, including wave and offshore wind parks (ongoing pilot projects),[27] deep-water oil drilling off of Portugal's mainland coast (projected),[28] seabed metal mining off the Azores archipelago (projected),[29] and offshore aquaculture, concur to the notion that mainly economic drivers underlie this legislation.

[26] In the U.S., an unobstructed view is part of a coastal land owner's bundle of property rights derived from English Common Law. Consequently, many states affirmatively grant riparian or littoral landowners the right to a view.

[27] A full-scale prototype of a windfloat was deployed off the coast of Aguçadoura, northern Portugal, in October 2011. Online at: http://www.principlepowerinc.com/products/windfloat.html; accessed 8 April 2015.

[28] Map of oil exploration concessions off the Portuguese coast, see Galp Energia webpage, at http://www.galpenergia.com/EN/agalpenergia/Os-nossos-negocios/Presenca-no-mundo/Portugal/Paginas/Exploracao-desenvolvimento-Portugal.aspx; accessed 8 April 2015.

[29] Interest from Nautilus Minerals, a Canadian company, in mining for polymetallic nodules in areas bordering hydrothermal vent fields (*e.g.*, Ribeiro, 2014b).

This palpable prospect of economic gain resulting from ocean exploitation, especially in the framework of the current economic crisis, when seen in conjunction with provisions put forward in Decree-Law 38/2015, raises concerns about the possibility of a gold rush on the Portuguese NMS (Ferreira *et al.*, 2015). One example is the exemption from payment of the private use fee of the NMS (TUEM) for the exploration and exploitation of geological and energy resources. Given the stated purpose of the TUEM, which includes anticipating the environmental costs of activities liable to cause significant impact, and the environmental risks posed by sea-bed mining and offshore oil drilling, such an exemption is a troubling sign of private interests prevailing over the public interest, given their potential for environmental degradation[30]. Questioned on the reasons for such an exemption, at a public session held in Lisbon on 26 March 2015 on the new Portuguese legal framework for MSPM, a public official stated that it was a "political option", because these activities are regulated by a different ministry and already subject to payment of a tax. Another example is the possibility of existing Marine Protected Areas (MPAs) created by the regional governments being excluded from the new MSP plans, if the national government determines that there is a need to safeguard national interests. Although the meaning of "national interest" is not clarified in Decree-Law 38/2015 (Ferreira *et al*., 2015b),[31] the expectation of net annual revenues in the order of €60 billion (10^9) from seabed mining on the seamounts around the Azores archipelago (APEDA, 2012), where several MPAs are established (OSPAR, 2012; Ribeiro, 2010; 2014), may be interpreted as such.

The record of pilot projects for MRE in Portugal is already marked by the failure of a wave park, 3 NM offshore of northern Portugal, which was presented as a pioneer project worldwide when it was launched in 2008 (Garcia, 2008; Power Technology, 2015). Three Pelamis machines were removed from the ocean after only four months in place. Technical problems caused by the harsh oceanic environment were the reason presented for the failure of the project. The Portuguese public electricity company purchased the 77% equity held by the private company to try to save the project (Pham, 2009). Despite that intervention, the private company later abandoned the project, which was never resumed.

[30] Cf. EU's MIDAS project (managing impacts of deep sea resource exploitation, at http://www.eu-midas.net/. Impacts of offshore oil drilling (Deepwater Horizon) cf. Mendelssohn *et al.,* 2012; Ocean Conservancy, 2014.

[31] In the U.S., for example, the definition is very narrow, and includes national security.

As of April 2012, the machines were "abandoned" in a nearby port (Correio da Manhã, 2012). This experience in the Portuguese scenario is strikingly similar with experiences in the U.S., and raises identical concerns in terms of the promotion of new activities at all costs, vs. a due consideration and protection of existing uses and a careful and comprehensive evaluation of alternatives, as discussed below.

Concerns over the protection of existing uses in Portugal's MSP framework

The definition of existing uses/activities, as it is stated in Decree-Law 38/2015, Article 9(3) leaves out any activities which are not being developed under a private use title of the NMS. Such a definition excludes an estimated 99% of the fishing activity in Portugal (Ferreira *et al.*, 2015a), an important component of the maritime sector (Calado & Bentz, 2010). It also excludes all other existing uses which do not require a private use title. Such an option disregards guidance from the EU MSP directive on the due consideration that should be given to ongoing uses and activities, including fishing areas (MSP Directive, Article 8). It also disregards the POEM, now considered as the reference situation, which included fishing areas (POEM, 2011).

As to existing jobs and activities, it is unclear how they will be preserved, if at all. The U.S. experience suggests that a focus on job creation, rather than on maintaining jobs keeping local and regional economies going, may endanger the livelihoods of coastal communities, and promote conflict instead of advantageous coexistence of uses.

The U.S. experience also shows that existing uses are not limited to fisheries and their related activities. They include non-consumptive uses which can be directly linked to various facets of the tourism sector, a huge driver of the Portuguese economy. In 2013, the direct influence of travel and tourism alone represented 5.8% of the Portuguese GDP, in comparison to 3.3% of total GDP in the EU, and approximately 2.9% of global GDP (WTTC, 2014). The ocean is crucial to most if not all ten strategic tourism products recognized by the national tourism agency for Portugal, as a premier coastal nation (Andrade *et al.*, 2009). These tourism products, which include sea and sun, nature and nautical tourism (*e.g.*, surfing, boating, cruises), eco-resorts, health and well-being, cultural and landscape touring,

etc. (MEID, 2011) rely, to a great extent, on the value of the landscapes (seascapes) and of other ecosystem services.

Aspects to consider in a full cost-benefit analysis of alternatives in Portugal's MSP

Law 17/2014 expressly states the objective of achieving compatibility of diverse marine uses. Arguably, this is not restricted to uses requiring a private use title of the NMS, because common use (including, for example, leisure) does not require such a title. However, by defining existing uses/activities as those being developed under a private use title of the NMS, the Decree leaves out all other activities which do not have such a requirement, severely constraining the potential effectiveness of the compatibility objective. The criteria set out for the determination of a preferred use or activity (*e.g.*, job creation, volume of investment, forecasted results, value creation, economic viability, and contribution to sustainable development) seem to further bias the system towards new or emerging activities. These aspects combined suggest a focus on the promotion of new activities over existing uses, and of the private over public, or common, interest. Evaluation of the effective sustainability of present and new uses also appears not to be duly considered.

Spatial planning of public assets, such as the ocean, involves political choices targeting the best overall welfare for society. Because space and resources are limited, increased use or protection of any one resource or ecosystem service (natural capital) implies a decreased use of another, with implications for the corresponding users. A trade-off analysis is important in any comprehensive, full Cost-Benefit Analysis (CBA) of alternatives. Such a comparison is often not obvious. Whereas some of the alternatives (and their associated benefits and costs) have a clear and well-established financial/market value, others do not. For natural capital with non-market value it is important to try to quantify benefits for society (for example, see Stanford University's InVEST—integrated valuation of ecosystem services and tradeoffs—a tool developed by the Natural Capital project) (InVEST, 2015). Perhaps more importantly, it is necessary to account for the costs that different alternatives impose on different users when the natural capital is disrupted – *i.e.*, the burden on society, including future generations. The U.S. experience shows that comprehensive CBA should consider a full economic evaluation of proposed projects,

including maintenance, removal and restoration costs. Such estimates should be independently verified, and include an assessment of displacement costs of existing uses (due to the installation of fixed structures), of the risk of regional job loss, and of the distribution of revenues (not only private *vs*. public benefit).

Failure to adequately consider the intrinsic value of the ocean in an analysis of alternatives in the framework of strategic MSP imposes serious consequences for its sustainability. An effective CBA should include an analysis of affected natural capital. One example, among the plethora of ecosystem services currently recognized (Liquete *et al*., 2013), is the scenic value of an undisturbed seascape – the visual beauty of the unencumbered ocean. Such an asset, highly valued both by people at sea and on the coast, may or may not have a market value attached to it (*e.g.*, beach-front property is worth considerably more than property with no sea view). As an example, the protection of viewsheds is explicitly included in Oregon's MSP, in the form of "Visual Resource Protection Standards" (OCMP, 2013). Even when it does not have a market value, the disruption of the seascape (*e.g.*, by the presence of a structure at sea clearly visible from land), considerably lowers its value (*e.g.*, recreational users will choose other destinations for their activities). Even if these aspects are starting to be studied in Portugal (Silva & Ferreira, 2014), they are usually not included in a full CBA of alternatives, and users (and society at large) only realize their true value once it is lost.

Although private financial profit may be easier to quantify than public (societal) gain, a full CBA of alternatives must be carried out in planning, allowing decision-makers, if not to quantify, at least to compare and understand the public ocean values and benefits at play. The cost of damage to public values (in the short and long term) posed by each development alternative would allow decision makers to promote transparency and fairness in MSP processes, attributes owed by the governing to the governed. A growing set of economic tools is becoming available to aid in such trade-off analyses (*e.g.*, Beaudoin & Pendleton, 2012; Champ *et al.*, 2003). The NOS 2013-2020 includes one project where ecosystem services are integrated into public policies for the ocean, based on and related to the TEEB (The Economics of Ecosystems and Biodiversity) approach (Sukhdev *et al.*, 2014).

Such an analysis must be conscientiously carried out through the SEA of the Portuguese NMS plans. SEA includes mandatory, detailed strategic and prospective planning, which is at the core of MSP theory and best practices (Ehler & Douvere, 2009). Despite the extremely short time frame allotted in the Decree for the development of the situation plan (six months from its publication), it is important that the SEA of the situation plan is more than the re-publication of POEM's SEA, a study which is now four years old and that was conducted in a different socio-economic and legal context.

Insights from national MSP experts

On 16 January 2015, an expert conference took place at FCSH/UNL with a double objective: i) to discuss the developing Portuguese MSP legal framework (Law 17/2014, and the Decree-Law Proposal developing the implementation of the MSPM Law and transposing EU's MSP Directive: later, Decree-Law 38, 2015), particularly the latter instrument; ii) to produce a document to be sent to the government with suggestions for improvement. The conference was organized in three sessions (Spatial planning, Law, and Environment) with specialists in themes related to MSP from academia and civil society as invited speakers. Table 2.4. (abridged from Ferreira *et al.*, 2015b)[32] summarizes the main findings. It was organized so as to clearly highlight the connections between the concerns raised and the corresponding suggestions, showing that no concern was left unaddressed.

These results mirror some of the concerns drawn from the U.S. MSP experience, such as the differential treatment given to uses and activities (including the exemption of payment of the private use fee), and the criteria for conflict resolution. Other aspects have since been resolved, such as the determination to subject the Situation Plan to Strategic Environmental Assessment (Ruling 11494, 2015).

[32] A full technical report of the conference (Ferreira *et al.*, 2015c) is available online at https://www.researchgate.net/publication/272784863_Relatorio_final_do_Debate_MAR_Portugues_Contributo_para_o_Ordenamento_Espacial.

Table 2.4. Synthesis of main concerns and corresponding suggestions for improving the proposed framework.

Theme	Concerns	Suggestions
Development model	Framework inspired by EU's Blue Growth model, ignoring sustainable development as a vision. Uses MSP as a licensing tool instead of a basis for social, environmental and economic development.	- Clarify the MSP policy of the NMS, namely vision, goals and objectives in the context of sustainable development taking into account the ecosystem approach (instead of just as a licensing regime).
	It is unclear how the economic revenue from private use of the sea including the private use fee (TUEM) will revert to public benefit.	- Allocate part of TUEM's revenue to an Ocean fund: stimulate national-based entrepreneurship & innovation for marine industries; invest on science and long-term environmental protection and conservation.
"One country, two systems"	Proposed MSPM system is not articulated: - Disconnected from coastal/terrestrial planning systems, lacking clarification on various key aspects; - Possibility of lower ranking allocation plans amending hierarchically superior plans inverts established best practices. MSPM instruments unsuitable for planning: - Situation plan: mere representation of current and potential uses, proposing no programmes or strategies; - Allocation plans: pathways for promotion of private interests; allocate *ad-hoc* patchwork of private pretensions at the expense of integrated public planning.	- Restructure the architecture and conceptual framework of the Portuguese MSPM system namely in what concerns spatial planning instruments. - Modify terminology: "Situation Plan", should be changed to "Map of existing and potential situation"; "Allocation Plans", when resulting from private initiative, to "Licensing Process for uses and activities". - Public and private investment should be directed to the Situation Plan, to enhance knowledge on existing activities and resources and the impacts and pressures they are subjected to.
Shared management with the Autonomous Regions (ARs)	Several norms in the Proposal deemed unconstitutional because they overlook principles of cooperation and shared management between central government and the ARs, and specific competencies of the ARs in relation to sea affairs.	- Clarify the concept of shared management and its domains of application in conformity with the Portuguese Constitution and the Political-Administrative statutes of the ARs.
International best practices for environmental sustainability	**Ecosystem-based management (EBM)** is advocated in the legal framework but not applied (no specific norms for achieving it).	- Adopt provisions for effective EBM, including fisheries (*e.g.*, consider the spatialization of fishing opportunities).
	Stakeholder engagement in managing the commons: While an innovative model of active stakeholder engagement is advocated, actual participation opportunities follow traditional models with low levels of engagement.	- Introduce effective/meaningful participation mechanisms, from the earliest stages of the planning process: ensure co-construction collaborative governance model; articulate multiple institut./societal layers; promoting shared responsibility.
	Strategic Environmental Assessment (SEA): The Situation Plan may be exempted from SEA, required under EU and national law. Allocation Plans are equated to projects, subject to EIA (legal framework for EIA in Portugal not designed for the reality of the marine environment). It is unlikely that Allocation Plans will include the necessary elements to identify and evaluate corresponding environmental impacts, promoting unreliable evaluations.	- Stipulate mandatory SEA of the Situation Plan and Allocation Plans to ensure sustainability of proposed options.

Table 2.4. Synthesis of main concerns and corresponding suggestions for improving the proposed framework.

Theme	Concerns	Suggestions
International best practices for environmental sustainability (contd.)	**Monitoring and evaluation:** Monitoring the implementation and development of licensed activities, increasing knowledge on the environment and their potential impacts is vital. The operational details of monitoring obligations of private users and the process of institutional interaction during the evaluation stages are vague, laconic or inexistent, in particular in relation to the mechanisms for collection, transmission, validation and evaluation of data and information.	- Promote monitoring and evaluation of environmental status: require collaboration of private users in provision of access, installation of platforms of opportunity and collection of data during exploitation; guarantee data availability to estimate all new sources of anthropogenic mortality to traditional fishery resources; extend the evaluation of acceptable exploitation level to new resources; clarify the role of private users and public institutions in the evaluation stage.
	International commitments: Possibility to automatically revoke instruments adopted under national and international commitments (*e.g.*, MPAs), under dubious concepts such as "national interest", impairs sustainable use and conservation goals implemented during the last decades.	- Remove the provision that allows revoking protective measures of resources and the environment on grounds of "national interest".
Differential treatment of uses and activities	Existing uses, namely fisheries (a traditional and socially important activity in Portugal), are not given equal treatment compared to potential emerging uses. Exemption of payment of TUEM by activities related to the "exploration and exploitation of geologic and energy resources" is environmentally incomprehensible and socially and economically unfair.	- Integrate fisheries and other existing (including non-consumptive) uses in the planning process in an equitable way. - Introduce a framework for co-management and shared responsibility in resource management, incl. *i.a.*, fisheries. - Remove the exemption of certain activities from TUEM, which should be higher for the most profitable (and most environmentally hazardous) activities.
Decision criteria for conflict resolution	Geared to the evaluation of social and economic advantages; based on vague, unreliable and undefined indicators. May generate practical problems, hindering the implementation of the legal framework. The mechanism (and related public costs) of relocating existing uses and activities may harm public interests and goals.	- Identify and use coherent and clear criteria for conflict resolution among competing uses or activities.
	Unrealistic response deadlines by the administration may lead to undesirable tacit approvals.	- Allot realistic response deadlines to allow for responses in a timely and professional/responsible manner.
Proposal's development process and general aspects	Unclear why the proposal's development process was not subjected to extensive public discussion, mandated by the transparency and participation principles.	- Subject the proposal to further meaningful discussion with a broad range of stakeholders prior to its implementation.
	Dubious/vague concepts and criteria.	- Clarify the wording of the proposal. - Make sure the current policy is coherent with the main responsibilities of a maritime country such as Portugal under national and international law and mechanisms.

2.6. Chapter summary

This chapter begins with an account of the importance of Portugal's maritime geography in determining the country's existence, history, and culture since immemorial times to the present, and how, along the way, Portugal's influence spread globally via the ocean and for the ocean. It proceeds with a description of the renewed maritime dimension of Portugal's territory as, at the turn of the 21st century, in the framework of the United Nations Convention on the Law of the Sea, the nation's maritime borders are being redrawn, meaning that Portugal has sovereignty or jurisdiction over almost 4% of the Atlantic ocean. In the last two sections of this chapter, the Portuguese legal framework for MSP is presented and discussed in detail. This information constitutes the basis for the results and findings presented and discussed in chapters 4 and 5.

Chapter 3 – Evaluation and indicators in planning

Includes results already published in:

UNEP (2014) Measuring success: Indicators for Regional Seas Conventions and Action Plans. Authors: Johnson, D., Benn, A., & Ferreira, M.A. UNEP Regional Seas Report and Studies No. 194, Nairobi. 214 p.

I started on a journey about a year ago
to a little town called Morrow in the State of Ohio.
I've never been much of a traveler, and I really didn't know
that Morrow was the hardest place I'd ever try to go.
(…)
If you had gone to Morrow yesterday now don't you see,
you could have gone to Morrow and returned today at three
For the train today to Morrow, if the schedule is right,
today it goes to Morrow and returns tomorrow night.

Bob Gibson (c. 1960)

Chapter 3 – Evaluation and indicators in planning

"Sustainable development requires an ongoing process of planning, management, evaluation, adaptation and accountability" (Pintér et al., 2012, p. 25)

"We measure what we value and value what we measure" (Gubbay, 2004, p. 3).

3.1. Evaluation in planning

Monitoring and evaluation[33] are key elements of the planning cycle. They allow learning from experience, the cornerstone of an adaptive approach to planning and management. In view of the specificities of the maritime space, of our current lack of knowledge on marine resources and associated processes and of ever-changing environmental, social and governance settings, marine spatial planning and management processes require constant adaptation to deal with uncertainty and change (Ehler & Douvere, 2009).

Other than increased information and knowledge, monitoring and evaluation contribute, ideally, to promote greater transparency and accountability, to greater understanding and support of public action, and, ultimately, to a more participated democracy (Ehler, 2014; Gobierno de España, 2010; Le Visage *et al*., 2012; Pereira, 2009; UNEP, 2014; Vilares, 2010). However, communication gaps between science and management have constituted a real obstacle to the development of better plans and policies (Diedrich *et al.*, 2010; Fritz, 2010; Van Koningsveld *et al*., 2005). Pintér *et al*. (2012) have stated that "the gap between the mainstream practice of measuring progress and what the public (and, increasingly, policy-makers) believes should be measured, has grown" and that "changing the way society measures progress represents a key leverage point in tackling the root causes of unsustainable development" (p. 20). Ferrão (2011) challenged spatial planning specialists (as mediators of dynamics and solutions) and political leaders (by

[33] *Monitoring* has been defined by the OECD as "a continuing function that uses systematic collection of data on specified indicators to provide management and the stakeholders of an ongoing development intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds." (OECD, 2002, p. 27,28) and *evaluation* as "the systematic and objective assessment of an on-going or completed project, programme or policy, its design, implementation and results. The aim is to determine the relevance and fulfilment of objectives, development efficiency, effectiveness, impact and sustainability." (*ibid.*, 21,22).

promoting ways to evaluate policies from a perspective of institutional learning) to collaborate to improve the efficiency of public spatial planning policies, namely through improved evaluation.

Evaluation can occur at different stages of the planning cycle and with different purposes. *A posteriori* evaluations, retrospective studies of the implementation of earlier versions of plans, occur at the end of each planning cycle (Figure 3.1.), and are useful to make better planning decisions. *A posteriori* evaluations aim to "learn about results and effects achieved with the implementation of a plan, comparing them with desired and expected results at the time of the evaluation (to learn about the instrument's efficacy and efficiency)" (Pereira, 2009, p. 90).

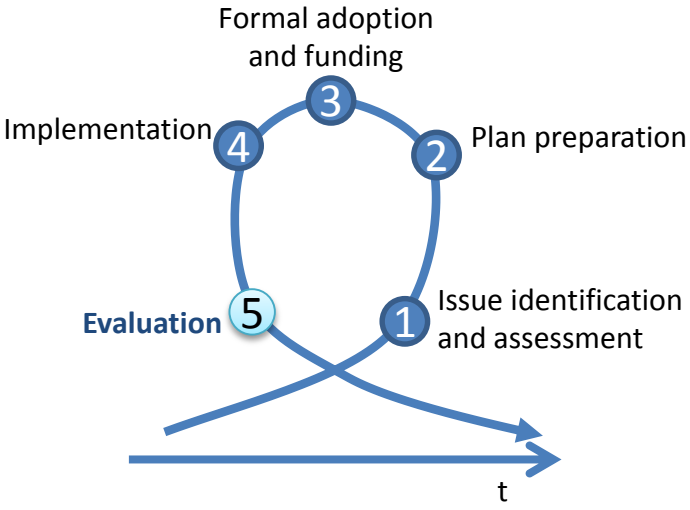


Figure 3.1. The planning cycle (adapted from Olsen *et al.*, 2011), highlighting the evaluation component.

Albeit considered important, *a posteriori* evaluations are still not common, and when they occur, focus preferably on the level of financial execution of implemented measures rather than on the global development of the territory (Pascual i Esteve, 2007). Such evaluations do not answer the question of whether or not, or how, plan implementation has been successful, *i.e.*, if implemented measures actually contributed to attain a given plan's objectives. Traditionally, evaluations have focused mostly on inputs (financial, human or material resources) and outputs (goods and services achieved through instrument implementation) (Ferreira *et al.*, 2013; Hockings *et al.*, 2006; Kusek & Rist, 2004). Such

evaluations "tell little about the effectiveness or efficiency of a (…) plan" (Ehler, 2014, p. 12). Conversely, results-based or performance (monitoring and) evaluation is "the ongoing activity for assessing program accomplishments, particularly progress toward pre-established goals and objectives and outcomes" (Ehler, 2014, p. 10). It goes beyond traditional input-output focused evaluation and has a greater focus on outcomes (the effects of public actions on people and the environment), which are, arguably, the most important and interesting results of planning, both for governments and for stakeholders (Ehler, 2014; Kusek & Rist, 2004).

From goals to indicators

While various logical models exist to describe the constitution and relationship between the main elements making up planning and management processes, there is some consensus among various authors as to their key components and interconnectedness (Figure 3.2.) (Day, 2008; Douvere & Ehler, 2011; Ehler & Douvere, 2009; Government of Canada, 2007; IOC, 2006).

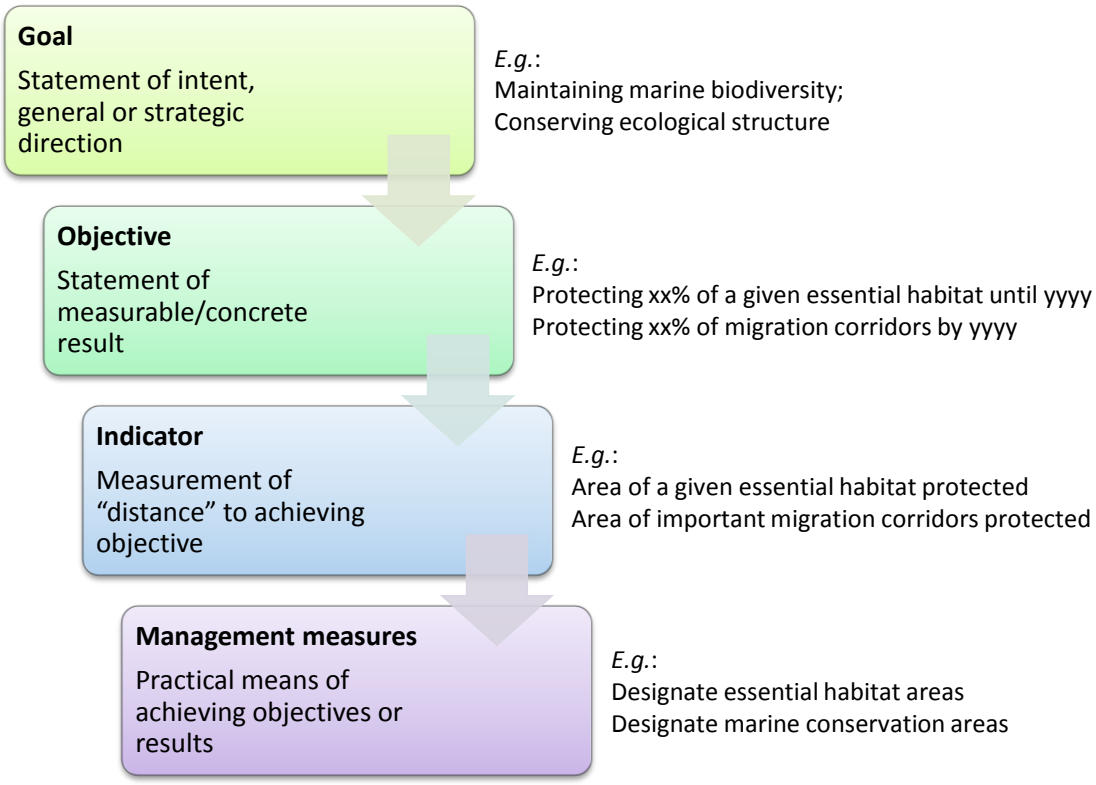


Figure 3.2. Simplified logical model of the connection between goals, objectives, indicators and management measures in maritime spatial planning (adapted from Douvere & Ehler, 2011).

- **Goals:** located at the top of the hierarchical structure, they constitute general/broad statements of intended results. They are the umbrella for development of lower level objectives and define the principles upon which they are based;

- **Objectives:** materialize the goals; used to guide development of management actions and strategies to meet defined goals, and the development of adequate indicators;

- **Indicators:** developed from the objectives; measures of the degree of fulfilment of objectives;

- **Management measures:** provide the means of achieving objectives or results.

In the case of MSP, as an example of goal, Douvere & Ehler (2011) proposed the "maintenance of marine biodiversity". From this goal, a concrete objective could be derived, such as "protection of a given percentage of essential habitat until a predefined deadline" (Figure 3.2.). Gilliland and Laffoley (2008) used a slightly different terminology and referred to "high level objectives" or "objectives", such as "exploiting renewable energies sustainably", from which they derived "targets" such as "producing 10% energy from renewables by… " (here, "targets" are the equivalent to "objectives" in Figure 3.2.). Still earlier, Jones (2000), had adopted still another terminology, proposing a hierarchy of general management objectives from which "key desired outcomes" could be derived, which should be specific, tangible and clearly articulated. These, in turn, would allow the identification of performance indicators.

Generally speaking, two main levels of objectives may thus be considered: a strategic level of general intentions, which are, by definition, abstract and cannot be measured (Ehler & Douvere, 2009) and an operational/concrete level that materializes the former. Concrete objectives should be SMART (Day, 2008; Douvere & Ehler, 2011): *Specific*: detailed, focused, clearly defining intended outcomes; *Measurable*, allowing results to be measured and which, ideally, should be expressed quantitatively; *Achievable*, attainable with a reasonable amount of effort and resources; *Relevant*, leading, in isolation or together, to an intended goal; and *Time-bound*, indicating start and finish dates for desired results. Various authors have stated that a clear definition of objectives is paramount to allow the systematic monitoring and evaluation of the results of any plans' implementation (Gilliland & Laffoley,

2008; Jones, 2000). It is also vital for the development of good strategies of data collection, related with the definition of indicator systems (Van Koningsveld *et al.*, 2005). Finally, the definition of clear objectives is fundamental in any planning process, to allow the specification of strategies and management measures to achieve them (Day, 2008).

Lessons learned with the results of monitoring and with the global evaluation of implemented management measures, allow plans to be adjusted and adapted as necessary (Figure 3.3.).

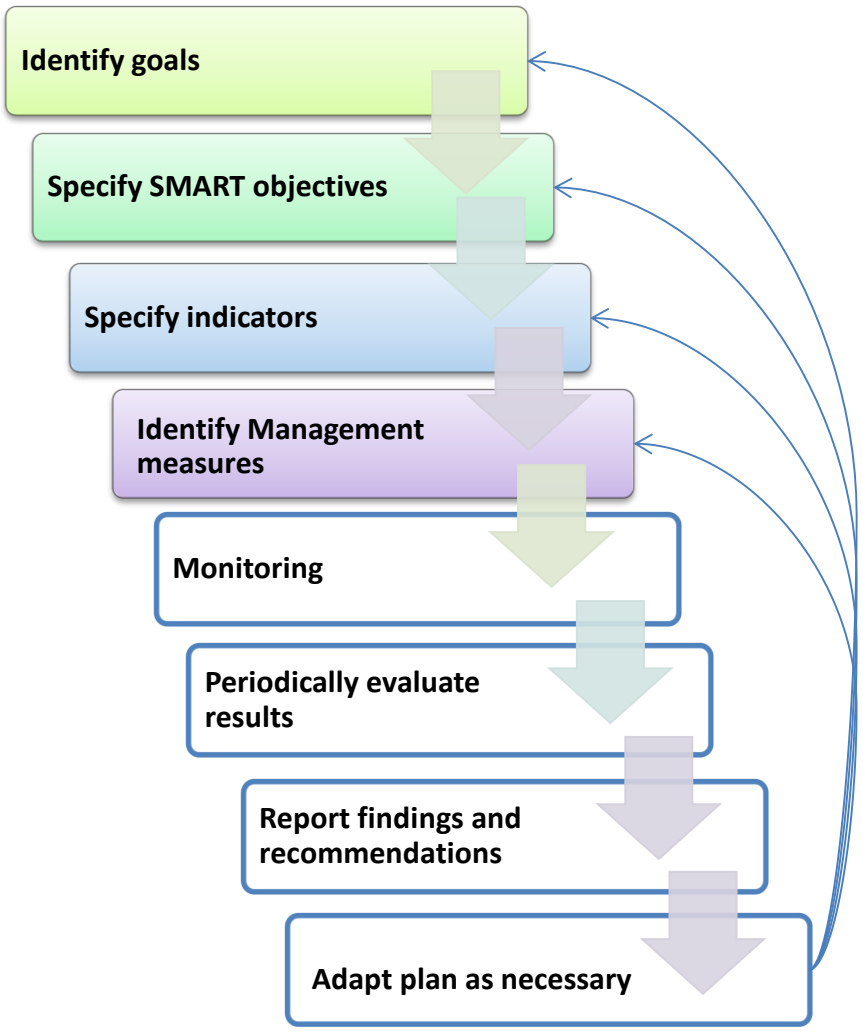


Figure 3.3. Key-steps of adaptive planning and management processes (adapted from Jones (2000), Day (2008) and Douvere & Ehler (2011)).

3.2. Indicators

Indicators[34] are, therefore, a key component in evaluation. Since they constitute the link between objectives and action in management, indicators are fundamental tools to monitor and evaluate plans, programmes and policies and to inform their adaptations and revisions (Degnbol, 2005). They are also a pervasive component of our everyday lives – we use them routinely to sort out information, and to make decisions (incl. ranking and prioritising our actions) (Meadows, 1998): our children's grades in school allow us to determine their success in learning, increased body temperature and heart rate may be signs of some health condition, speedometers tell us how fast we are going, cloud cover and a morning chill remind us to use an umbrella and to put on a coat… The European Environment Agency defined indicator as "a measure, generally quantitative, that can be used to illustrate and communicate complex phenomena simply, including trends and progress over time" (EEA, 2005, p. 7). Diedrich *et al*. (2010) defined indicators as "measurements that should quantify and simplify information related to trends that cannot be easily observed". The following definitions are listed in UNEP (2014):

- **Measure**: a value that is quantified against a standard at a point in time;
- **Metrics**: a set of measurements or data collected and used to underpin each indicator *e.g.*, GDP per capita. Metrics usually have units;
- **Indicator**: a measure or metric based on verifiable data that conveys information about more than itself. It is information packaged to communicate something important to decision-makers. Generally a combination of two or more metrics (*e.g.* economic dependency on water resources). Indicators may or may not have units, depending on how they are formed;
- **Index**: a numerical scale used to compare variables with one another or with some reference number. A combination of two or more indicators (*e.g.*, socioeconomic index). Indices are generally dimensionless and usually have normalized scores.

Indicators fulfil four main and essential functions: simplification, quantification, standardization, and communication (Gubbay, 2004; IOC, 2006).

[34] Meadows (1998, p.1) listed a wide range of other names for indicator: "sign, symptom, omen, signal, tip, clue, grade, rank, data, pointer, dial, warning light, instrument, measurement".

It may be useful to consider different "levels" of indicators. For example, Eurostat (2013) structured their set of sustainable development indicators as a multi-tiered pyramid. Four levels of indicators are considered:

- **Headline indicators** (at the top of the pyramid)**:** indicators "with a high communicative and educational value", monitoring "overall objectives"[35];
- **Second level indicators**: lead indicators in their respective sub-themes, related to "operational objectives";
- **Third level indicators**: indicators related to particular (management) actions or breakdowns of higher level indicators; and
- **Contextual indicators**: provide "valuable background information" on relevant issues, being useful to better understand the evaluation topic, but do not relate directly to the monitoring of any one particular objective, or are not policy responsive.

The construction and characterization of an indicator typically requires the compilation of a vast set of information, encompassing but not limited to (APA, 2007; Heink & Kowarik, 2010; IOC, 2006): nature of the indicator (definition and measurement units); goals and objectives; relevance (if it is a key-indicator in relation to a given issue); methodology (definitions and underlying concepts, measurement approaches, limitations of the indicator, state of development of the methodologies); data evaluation (necessary data to compile the indicator, data sources and collection methods, data availability, analysis and interpretation of results, reporting and outputs); additional information such as which organizations and programs are involved in the development of the indicator, references, etc.

A key aspect in the characterization of a given indicator is the recognition that it is not static. As such, it is important to consider current and desirable trends of any indicator's behaviour. This implies the definition of reference values (the indicator's value at time zero), keeping in mind that such values may be well below historic values ("shifting baselines" concept referred to in Pauly, 1995; cf. also Roberts, 2007). Equally important is the

[35] One successful example of the use of headline indicators to communicate simple and powerful messages, is the Puget Sound (U.S./Canadian border) "Vital Signs" initiative, monitoring the recovery of the health of the Puget Sound (PSP, 2016).

definition of a target value (the desired value for the indicator over a given period of time) or, inversely, of a limit value (to control negative tendencies) (Vilares, 2010).

From a range of possible indicators, it is important to elect the most relevant for each situation. Selected indicators, preferably few, should satisfy the greatest possible number of criteria, so as to contain costs and maximize resources. This promotes greater efficacy of the monitoring/evaluation system to be implemented (Diedrich *et al.*, 2010; Vilares, 2010). Selected indicators should also contain consistent information to allowing reporting at different scales (regional, national and international) and across different jurisdictions (Diedrich *et al.*, 2010). Other aspects to consider are (Douvere & Ehler, 2011; Hammond *et al.*, 1995; IOC, 2006; Johnson, 2008; Vilares, 2010): political relevance (governance performance); information availability; cost-effectiveness; context sensitivity (sensitive to changes in aspects being monitored and allowing the detection of trends or impacts resulting from plan implementation); comparability (in time and space allowing for interregional or international comparisons); robust and scientifically credible; concrete, readily measurable, interpretable and specific (clear causality); and adapted to intended users, so that they answer the needs of their different target-groups. In practice, often only two or three such criteria are effectively used to rank indicators (*e.g.*, Coelho *et al*., 2010; Ramos *et al.*, 2004).

In a context of environmental planning and management based on a paradigm of sustainable development three main types of indicators are generally considered: ecological, socio-economic and governance (IOC, 2006; Pintér *et al*., 2012). In turn, these can be grouped into two main categories (MAOT, 2010; Vilares, 2010):

- **Efficiency indicators**, measuring the performance of different programme components and the progress and quality of interventions and of the governance process itself; and,
- **Efficacy indicators** (ecological and socio-economic), reflecting tendencies in the state of the environment and in the state of the human component of coastal and marine ecosystems (economic activity). They help measure to what extent the instrument is contributing to manage human pressures in a way that results in an improved natural environment as well as in sustainable socio-economic benefits.

Indicator frameworks

One important aspect in the construction of an indicator system is the selection of a reference framework, "the conceptual basis from which pertinent issues to be measured by the indicators and the domains of their observation are identified" (Vilares, 2010, p. 46). At the international level, several frameworks have been adopted for different purposes and in different contexts, and their choice is determined by the motives of the creation of a given process. A combination of frameworks may be useful, since one single framework may not be enough to identify the best combination of indicators for a particular process (IOC, 2006). Table 3.1. synthetizes key aspects of some of the most common reference frameworks.

Table 3.1. Examples of reference frameworks for indicator systems (based on Vilares, 2010).

Reference framework	**Objective**	**Components**	**Observations**
IOOO – *Input-Output-Outcome-Outreach*	Monitoring/evaluation of key aspects in the design, implementation and production of effects of planning cycle	*Input*: resource indicators; measure what is being spent; information base *Output*: realization indicators; measure what is being produced *Outcome*: results indicators; measure direct effects in the long-term Outreach: impact indicators; long-term indirect effects	Efficiency – realizations vs. resources Efficacy – results vs. stated goals
PSR – *Pressure-State-Response*	Used specifically for environmental issues	*Pressure indicators*: measure pressures on the environment State indicators: measure the characteristics of the environment resulting from the pressure Response indicators: measure society responses (public and private agents) to environmental changes	-
DSR – *Driving forces-State-Response*	Environmental issues but also, social, economic and institutional	*Driving forces*' indicators: measure the pressures resulting from social, economic, and institutional activities and measure their (positive and negative) effects on the environment	Derived from the previous
PSIR – *Pressure-State-Impact-Response*	Separates the state of the environment from produced changes	*Impact* indicators – measure the changes introduced in the environment	Variation from PSR
DPSIR – *Driving forces-Pressure-State-Impact-Response*	Internalize the externalities resulting from human activities	The drivers are externalities from human activities (industries, …) which exert pressures (*e.g.* pollution) that degrade the environment. Resulting impacts trigger responses (management measures, policies)	Synthesis of developments to PSR by the European Environment Agency

There are a number of variations on the IOOO (Input-Output-Outcome-Outreach) framework. The 2006 IOC/UNESCO handbook for measuring the progress and outcomes of integrated coastal and ocean management, divides the planning/project cycle (and therefore, the elements of its analysis and evaluation) into Inputs (adequacy of resources for achieving management objectives), Process (adequacy of management processes and systems *vis-à-vis* management objectives), Outputs (measures actual vs. planned expenditures and work outputs); and Outcomes (long-term and bigger scale achievements brought on by the implementation of a given plan or policy) (IOC, 2006).

Recognizing that there is a temporal dimension to the implementation of policy and planning, and, concomitantly, to the achievement of palpable results of these initiatives, Olsen (2003) proposed a modified framework for assessing progress of planning initiatives – the four Orders of Outcomes:

- **First order outcomes** (Enabling conditions): building constituencies, developing and adopting plans, establishing mandates and authorities, securing funding;
- **Second order outcomes** (Changes in behaviour): investments in infrastructure, modified behaviours from stakeholders and institutions affecting resources of concern;
- **Third order outcomes** (The harvest): improved (restored or maintained) social and/or environmental qualities;
- **Fourth order outcomes** (Sustainable development): achieving a balance between social and environmental conditions.

Although Olsen's "Orders of Outcomes" framework was specifically developed for integrated coastal management initiatives, it is applicable to any initiative targeting sustainable development, or, at least, more sustainable forms of development.

It is timely to consider here another framework for sustainable development indicators suggested by Donella Meadows, in her 1998 report to the Balaton Group[36]. The framework was based on a diagram drawn by Herman Daly many years prior, "relating natural wealth to ultimate human purpose through technology, economy, politics, and

[36] The Balaton group, founded in 1982, is "a global network for collaboration on systems and sustainability" whose members include system analysts, scientists, poets, policy makers (cf. http://www.balatongroup.org/).

ethics" – the Daly Triangle (Meadows, 1998, p. 40; Figure 3.4). Meadows (*ibid*.) pointed out two important aspects of this representation: i) "to situate the human economy within a hierarchy, resting on a foundation of natural resources and reaching to the height of ultimate purpose" (p. 41); and ii) "the logical relationship among the levels of the hierarchy" (p.44). For Meadows, this representation highlighted the two things that ultimately count, "the health of nature and *real* human well-being" (p. 44), and "the three most basic aggregate measures of sustainable development [which] are *sufficiency* with which ultimate ends are realized for all people, the *efficiency* with which ultimate means are translated into ultimate ends, and the *sustainability* of use of ultimate means" (*ibid*. p. 45).

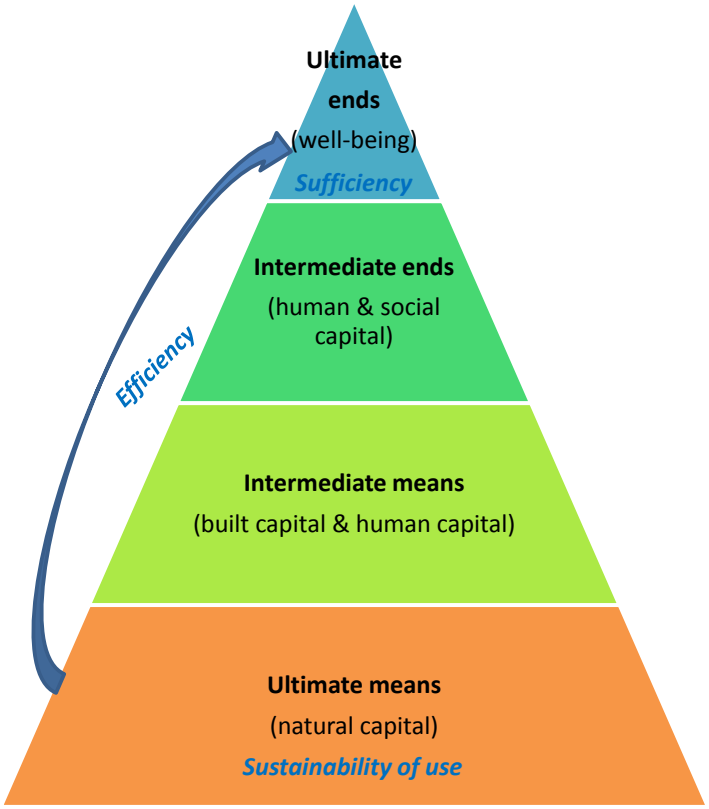


Figure 3.4. The Daly triangle relating natural capital (referred to as ultimate means: solar energy, raw materials, ...) to well-being (the ultimate ends of happiness, self-respect, self-realization, …) (adapted from Meadows, 1998).

Making indicator systems operational

A vital aspect in the development of an indicator system is ensuring conditions to make it operational. Thus, it is important to plan for the implementation of the indicator system including effective conditions for its deployment, namely the entities, stakeholders involved, hierarchy, design of the structure of data collection, and processing, including an

obligation of data sharing among data/information providers and holders; minimum spatial and temporal disaggregation, etc. (Pereira, 2012).

Naturally, this entire process, including the definition of the indicator system, and the fulfilment of its implementation plan, within the broader framework of the planning/management process, mandatorily requires the involvement of relevant stakeholders through a collaborative approach, including institutional, sectoral and representing civil society (namely Environmental Non-Governmental Organizations), thus integrating the three base sectors of society – government, private sector and civil society (Calado *et al.*, 2010; 2012; Diedrich *et al.*, 2010; Ramos, 2009; Van Koningsveld *et al.*, 2005). Effective stakeholder involvement in the planning process, when correctly designed and implemented, results in greater acceptance and adherence/commitment from participants and in better and more innovative results (Calado *et al.*, 2010, 2012; Pomeroy and Douvere, 2008; Gopnik *et al*., 2012).

The identification of information gaps (and of other information needs), as well as of the main sources of uncertainty (ecological, social, and economical) are also fundamental (Costanza *et al*., 1998; Lyytimäki & Rosenström, 2008). This "gap-analysis" process aims at: i) improving the relationship between objectives, management measures and monitoring programmes; ii) highlight/reveal/disclose gaps in knowledge and, as such, justify the need to reallocate resources; iii) through the identification of critical gaps or uncertainties, to guide the development of dedicated research and monitoring programmes to inform management (Day, 2008; Van Koningsveld *et al*., 2010).

Lastly, it is important that the indicator system includes "an evaluation of the evaluation" *i.e.*, a meta-evaluation mechanism. More precisely, this means the incorporation a self-assessment quality control methodology that critically revises the system's strengths and weaknesses and "draws conclusions on its utility, accuracy, validity, feasibility and propriety" (Ramos & Caeiro, 2010, p. 158). According to these authors, it is more important to consider performance indicators as a set than individually. Based on their experience with Portugal's system of sustainable development indicators, they put forward a set of key good-practice factors to assess the development of indicator systems in the planning/conceptualization and implementation/operation stages. Key good-practice factors include, *i.a.*: objectives, scope and scale effects; target audience; management

model and institutional cooperation; revision and updating procedures; governance and public participation process; cost-benefit analysis; conceptual coherence and relevance; methodological approaches for data collection (*Ibid*.). According to Lyytimäki and Rosenström (2008), monitoring and evaluating how indicators are used and learning from this can be considered as "the one key challenge for future research on sustainable development frameworks and indicators" (p. 311).

Clearly, the definition and establishment of an indicator system is, in itself, a complex, iterative and adaptive process. As such, it is both important and useful to elaborate a "manual of the indicator system", or, more thoroughly, a "manual of the monitoring program" which compiles all the information relative to the indicators and to how the system is made operational, namely including standardized definitions, methodologies, data collection periods, responsible people/agencies, feedback mechanisms, etc. (Goswami, 2006).

3.3. Evaluating MSP

The ever-growing human pressures on the marine environment, and the pivotal role of the ocean in determining sustainable development and ultimate well-being of humankind, renders the evaluation of ocean governance initiatives, particularly MSP, essential. The importance of evaluating the success of integrated ocean management initiatives, particularly MSP, is widely recognized (UN, 2016), and there is a growing experience and literature on practical examples of attempts at MSP evaluation worldwide. Table 3.2. briefly compares fourteen examples, in terms of the size of the planning areas, the stated goals and objectives of their marine spatial plans or integrated management plans, and the consideration and adoption (or not) of evaluation mechanisms and indicators. From the list of examples considered here, half contemplate evaluation mechanisms and the corresponding indicators.

Table 3.2. Examples of marine spatial planning initiatives worldwide, their stated goals or objectives, and reference to their proposed evaluation mechanisms, including indicators, when available (shaded lines).

Plan and planning area	Plan's goals/ objectives (abridged)	Evaluation mechanism /Indicators
Australia		
Great barrier reef (GBRMPA, 2014) (344,400 km^2)	Protection of the biodiversity of the Great Barrier Reef (primary objective)	**49 indicators to assess management effectiveness on context, planning, inputs, process, outputs, outcomes**
North Marine Bioregional plan and SW marine plan (AG, 2012, 2012b) (area unknown)	Ensure a healthy and resilient marine environment	**No indicators proposed;** refers need to establish/develop indicators (incl. ecological) for monitoring, evaluation and reporting ecosystem health (mid/long term)
Canada		
Placentia Bay/Grand Banks Int. Management Plan (2012-2017) (FOC, 2012) (>550,000 km^2)	1. Collaborative and Effective Governance; 2. Sustainable use 3. Healthy Ecosystems	A "practical set of indicators for measuring and describing progress against objectives and strategies" is mentioned as a "key evaluation mechanism"; **no indicators specified**
Eastern Scotian Shelf Int. Ocean Management Plan (FOC, 2007) (c. 325,000 km^2)	1. Collaborative governance and integrated management 2. Sustainable human use 3. Healthy ecosystems	(as above) **no indicators specified**
Gulf of St. Lawrence Integrated management plan (FOC, 2013) (c. 240,000 km^2)	Strategic Objective – Healthy, Sustainable and Productive Aquatic Ecosystems	Evaluation (monitoring, review and adaptation) based on plans' outcomes and evaluation of planning process are mentioned; **no indicator system referred**
USA		
Rhode Island Ocean Special Area Management Plan (RICRMC, 2010) (c. 3,885 km2)	1. Foster properly functioning ecosystem; 2. Promote and enhance existing uses 3. Encourage marine-based economic development. 4. Build framework for coordinated decision-making: state/federal agencies	Evaluation based on Progress in Assembling the Enabling Conditions (First Order Outcomes) (**13 indicators proposed**)
Massachusetts Ocean Plan (Commonwealth of Massachusetts, 2009) (5,554 km^2)	1. Balance and protect natural, social, cultural, historic, and economic interests 2. Recognize/protect biodiversity, ecosystem health, and interdependence of ecosystems 3. Support wise use of marine resources 4. Incorporate new knowledge as the basis for management	**Proposed a set of performance indicators for the plan** (revised in 2015)
Norway		
Barents Sea and Lofoten Islands Integrated Management (RNME, n.d.) (<1,400,000 km^2)	Promote value creation and maintenance of environmental assets; framework for activities; facilitate coexistence between industries involved while considering the environment	**Proposed a set of indicators** for monitoring environmental quality
Scotland		
Shetland Marine Spatial Plan (SIC, 2013) (10,580 km^2)	1. Ensure high quality, fully functioning marine and coastal ecosystem; 2. Protect and enhance marine waters and coastal environment; 3. Promote sustainable marine development	**Proposed a set of indicators** intended to allow the impacts of the SMSP to be monitored

Table 3.2 (contd.).

Plan and planning area	Plan's goals/ objectives (abridged)	Evaluation mechanism /Indicators
England		
East Inshore (6,000 km^2) and East Offshore (49,000 km^2) Marine Plans (MMO, 2014)	- Promote sustainable development of economically productive activities; - Support activities that create employment at all skill levels; - Realise sustainably the potential of renewable energy, particularly offshore; - Reduce deprivation and support vibrant, sustainable communities; - Conserve heritage assets; - Healthy, resilient, and adaptable marine ecosystem. - Protect, conserve and, recover biodiversity dependent upon plan areas. - Support objectives of MPAs; - Facilitate action on climate change adaptation and mitigation; - Ensure integration with other plans; - Continue to develop evidence base to support implementation, monitoring and review of marine plans.	**Proposes a set of output and outcome indicators** associated with plan objectives
Belgium		
Plan d'aménagement des espaces marins (Royaume de Belgique, 2014) (3,500 km^2)	- Sustainable maritime economy - Solid, healthy and equitable community - Living with environmental conditions - Promotion of a good governance - Responsible use of scientific knowledge	**No indicators are proposed**
Netherlands		
Integrated management plan for the North Sea 2015 (IDCCNS, 2005) (58,000 km^2)	Enhance the economic importance of the North Sea and maintain and develop the international ecological and landscape features by developing and harmonizing sustainable spatial-economic activities, taking into account ecological and landscape features.	**No indicators are presented.** Uses OSPAR's Ecological Quality Objectives to assess level of biological effects of pollution; indicators will be identified that accurately describe the North Sea's health, safety and profitability
Germany		
Spatial Plans German EEZ: North Sea (28,600 km^2); Baltic sea (4,500 km^2) (BSH, 2009)	- Ensuring navigation safety and efficiency - Protection of marine environment - Commercial uses - Scientific uses.	**Do not propose indicators**. Applicability of existing monitoring and national/international monit. measures will be scrutinised
Portugal		
Plano de Ordenamento do Espaço Marítimo (POEM) (MAOT, 2010) (328,000 km^2)	- Take stock of maritime uses/activities; - Plan present and future maritime uses in articulation with coastal management; - Ensure sustainable resource use; - Define sustainable development parameters for each maritime activity; - Define other activities likely to be developed in the mid- to long-term; - Foster the economic, environmental and social importance of the sea; - Define guidelines to develop indicators.	**Proposed 15 indicators of efficiency,** to assess strategic and operational performance (governance indicators), **and 20 indicators of efficacy,** to evaluate the effects of the plan's implementation in socioeconomic and environmental terms

Clearly, proposed evaluation mechanisms have different objectives: while some focus on specific aspects such as environmental quality (Norway) or outcomes, specifically first order outcomes (U.S. examples), others focus on a wider array of aspects, including management effectiveness on context, planning, inputs, process, outputs, outcomes (the Great Barrier reef marine park).

As recognised by Carneiro (2013) Portugal's proposed evaluation mechanism is somewhat singular in that it specifically intends to address effectiveness and efficiency.

One interesting commonality among the instruments proposing indicators for their evaluation is that while agents/stakeholders are often mentioned as key informants/information providers for the evaluation to be carried out, they are typically not mentioned in reference to the development processes of those indicators, which are, usually, proposed internally by the planning team.

In practice, however, there is still limited knowledge on how to actually carry out performance evaluation in MSP. Carneiro (2013) suggested a two-fold reason for this current low level of knowledge on MSP evaluation: on the one hand the "low priority assigned in practice to the evaluation of marine management in general and MSP in particular"; and the fact that "there is too little practical experience of MSP to enable the collection and analysis of sufficient implementation data for meaningful evaluation" (p. 215).

A framework for organizing MSP principles

For Carneiro (2013), "the degree of beneficial change that any intervention brings about is the ultimate criterion of its success" and, therefore, "outcome and impact measurement is the most critical task in evaluation" (*ibid*., p. 218). Such measurements, this author points out, are those posing the greatest methodological challenges, largely because of the issue of "attribution" (the clear identification of cause and effect relationships), which, he considers to have been largely overlooked by the MSP literature.

In 2011, a study was conducted by the Policy Research Corporation on behalf of the European Commission and DG MARE on "the economic effects of Maritime Spatial Planning". It constituted an attempt to ascertain what types of economic benefits may result from MSP, particularly for the maritime economy and its stakeholders (excluding

employment and environmental effects) (EC/DG-MARE, 2011). Following a detailed analysis of the ten key principles of MSP listed in the European MSP Roadmap (excluding the overarching principle of ecosystem-based management), and finding a parallel with the IPOO framework, the authors proposed the existence of three types of principles (Figure 3.5.), where:

- ***input principles*** "determine the scope of MSP, *i.e.* knowing what to achieve with MSP in which area". Include three principles: MSP by area and type of activity, define objectives to guide MSP and data and knowledge base;
- ***process principles*** relate to "organising MSP (so that) its objectives can be reached. Include three principles: MSP in a transparent manner, stakeholder participation, and incorporate monitoring and evaluation; and
- ***effect principles*** help define "what to achieve with MSP". They include four principles: ensure the legal effect, coordination within member states – simplifying decision processes, cross-border cooperation, and coherence between terrestrial and maritime spatial planning (*ibid.*, p. 13).

According to the report, the four effect principles contribute to predictability and certainty in MSP, which relate to coordination efficiency, entailing reduced transaction costs (incl. legal costs and administrative costs, and fewer conflicts), resulting in an improved investment climate, and ultimately in economic growth (EC/DG-MARE, 2011). Economic benefits of MSP were the focus of the EC/DG-MARE 2011 report.

While ecosystem-based management was recognised throughout the EC/DG-MARE study as the overarching principle of MSP, it was not detailed in the analysis conducted therein. From the analysis of table 1.1. it becomes clear that some of the key principles of EBM are represented in each of the three types of principles of MSP: "consider all forms of relevant information" (in inputs, under data and knowledge), "involve all relevant actors" (in process, under stakeholder participation), and consideration of the effects of activities in adjacent ecosystems (effects, under coherence with ICZM and cross-border cooperation). For being transversal to the three types of principles, and overarching, it is included here, represented above all the other principles (Figure 3.5.).

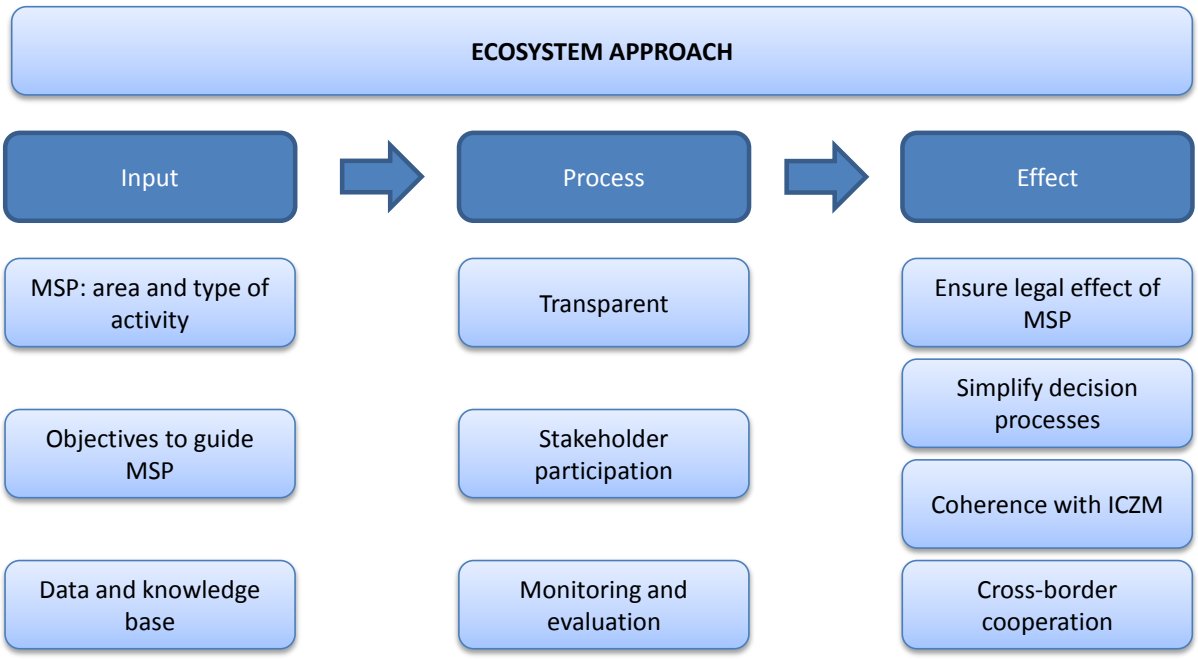


Figure 3.5. Cause and effect diagram integrating the key principles of MSP (adapted from EC/DG-MARE, 2011). The original figure does not include the overarching principle of ecosystem-based management.

3.4. Evaluation of coastal and ocean plans and policies in Portugal

In Portugal, little attention has been given to the evaluation of coastal and ocean plans and policies (Ferreira *et al.*, 2013, 2014)[37]. In what concerned the NOS 2006-2016, "the lack of an action plan or a matrix of indicators prevent(ed) the objective assessment of how the situation (was) progressing and of the effectiveness of the plans and programs implemented" (Resolution of the Council of Ministers 12, 2014, p. 1314). Concerning specifically MSP, as highlighted by Frazão Santos (2016), "so far there was never a completion of the five mains steps of the policy cycle. Instead, the national MSP process consists of portions of "unconnected" cycles, namely two subsequent initiatives [POEM and MSP legislation] that do not seem to 'build strategically on a careful assessment of what can be learned by earlier attempts to address the same or similar issues'" (p. 103) (Figure 3.6., left). This practice, Frazão Santos points out, is continued in the current MSP system, where "the MSP framework law [Law 17, 2014] is to be implemented (step 4) by MSP regulations [including Decree-Law 38, 2015], which in turn are to be implemented (step 4) through the Situation Plan", *i.e.*, systematically skipping the evaluation stage (*ibid.*) (Figure 3.6., right).

[37] Portuguese philosopher José Gil refered to Portugal as "the country of 'non-inscription'" (p. 15), where "inscribing" implies "action, affirmation, decision" (p. 17). In Portugal, the absence of a practice of evaluation in planning can be seen as an example of "non-inscription".

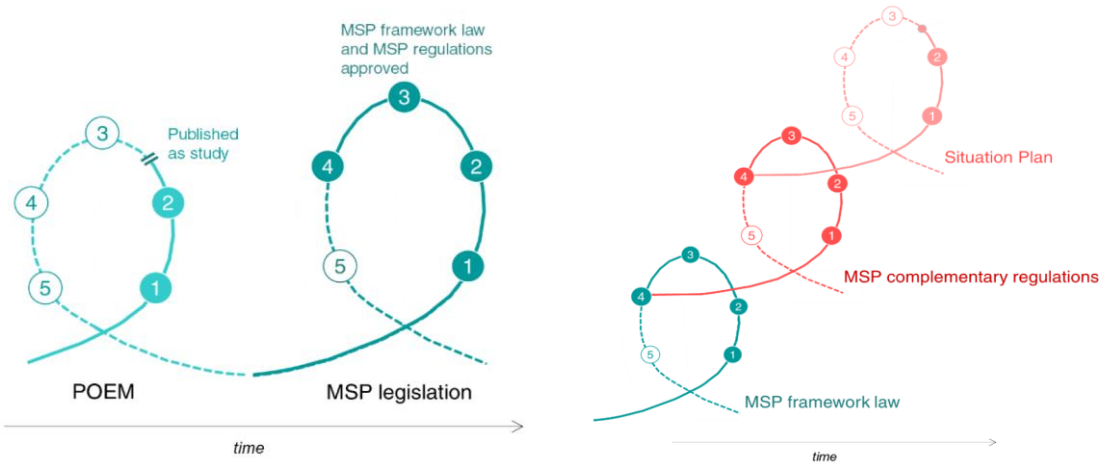


Figure 3.6. The policy cycle of the Portuguese MSP process. Left: Between former and current system; Right: Within the current system (used from Frazão Santos, 2016, with the author's permission).

However, in the new Portuguese policy framework for the maritime space, both the NOS 2013-2020 and the MSPM Law specifically address the need for monitoring and evaluation. Decree-Law 38/2015 determines (Article 87(1)) that DGPM is responsible for promoting "the permanent evaluation of the spatial planning instruments of the NMS", "namely by taking into account the objectives and indicators established for the monitoring and evaluation of the National Ocean Strategy". It further stipulates (Article 87(2)) that, as a result of such an analysis, DGPM may recommend "the revision or amendment of the spatial planning instruments of the NMS". The possibility to recommend the revision or amendment of the Situation Plan as a result of evaluation is particularly important as no mandatory revision period for the Situation Plan is legally stipulated (Article 39 of Decree-Law 38, 2015).

As pointed out by Carneiro (2013), "what to evaluate depends unavoidably on the timing of the evaluation" (p. 216). Portugal is presently developing the Marine Spatial Plan – the Situation Plan – for the entirety of its NMS. However, even though no plans exist as yet, and "while (…) many tangible results could take 5-15 years to be realized, it's not too early to think about evaluating the results of MSP" (Ehler, 2014, p. VI). In fact, "the earlier an evaluation is planned the more informative it will be" (Carneiro, 2013, p. 215).

The development and discussion of a mechanism for the evaluation of Portuguese MSP performance, one that may hopefully be exported to other contexts, is the subject of the next chapters.

3.5. Chapter summary

The chapter began with a general discussion of evaluation in planning, focusing on objectives and indicators, and exploring various aspects related to the latter, including indicator frameworks, and key elements in making indicator systems operational. A discussion on specific aspects related to evaluation in MSP ensued, with examples of MSP evaluation initiatives worldwide and of a framework for organising MSP principles.

The chapter ended with a brief discussion on the practice of evaluation of coastal and ocean plans and policies in Portugal. These findings are further discussed in chapter 5.

Chapter 4 – Indicator system development process: methods and results

Includes results already published in:

Ferreira, M.A., Johnson, D., & Pereira da Silva, C. (2016). Measuring success of Ocean governance: a set of indicators from Portugal. *Journal of Coastal Research*, *SI 75*, 982-986.

Ferreira, M. A., Johnson, D., Pereira da Silva, C., & Ramos, T. (2016b). Performance evaluation for Portuguese Marine Spatial plans. In: Joanaz de Melo, J., Disterheft, A., Caeiro, S., Santos, R.F., Ramos, T. (Eds.), *Proceedings of the 22nd International Sustainable Development Research Society Conference (ISDRS 2016) – Rethinking Sustainability Models and Practices: Challenges for the New and Old World Contexts.* Volume 1 (pp. 90-103). Lisbon: FCT/UNL, CENSE, ISDR Society.

Ferreira, M. A. (2016). *Indicadores para avaliação do desempenho do sistema de ordenamento do espaço marítimo nacional: Relatório do Workshop participativo de 23 de Março de 2016*. CICS.NOVA/FCSH-UNL e CENSE/FCT-UNL. Lisboa, Maio de 2016. 20 pp + Anexos. *DOI: 10.13140/RG.2.1.2606.8087*

Ferreira, M. A. (2016b). *Indicators to evaluate performance of the Portuguese MSP system: Final report of the Participatory Workshop of March 23, 2016* (abridged version of the full report in Portuguese). CICS.NOVA/FCSH-UNL and CENSE/FCT-UNL. Lisbon, June 2016. 19 pp + Annexes. *DOI: 10.13140/RG.2.1.4794.3280*

You all have learned reliance
On the sacred teachings of science
So I hope, through life, you never will decline
In spite of philistine defiance
To do what all good scientists do…
Experiment
Make it your motto day and night
Experiment
And it will lead you to the light

Cole Porter (1933)

Chapter 4 – Indicator system development process: methods and results

4.1. Methodology

The mixed-methods research methodology presented herein is grounded on "pragmatism", an epistemology that "arises out of actions, situations, and consequences" concerned with "applications – what works – and solutions to problems" (Creswell, 2014, p. 39). Within a pragmatic worldview, instead of focusing on methods and on "the underlying philosophical debates" (Ritchie & Lewis, 2003, p. 15), researchers "emphasize the research problem and use all approaches available to understand the problem" (Creswell, 2014, p. 39). On a practical level, this allows researchers to use a combination of methods from the "social researcher's 'toolkit'" (Ritchie & Lewis, 2003, p. 15) that best meet their needs and purposes (Creswell, 2014). Such mixed-methods approaches or mixed-mode designs, *i.e.*, approaches using a mix of qualitative and quantitative methods, are found to be highly desirable and may even "lead to unique insights" (Bhattacherjee, 2012, p. 104).

The mixed-methods approach adopted for this research – the participatory development of indicators for the performance evaluation of Portuguese MSP – consisted of a combination of qualitative findings from expert/stakeholder interviews, substantiated by quantitative indicator rankings from questionnaires and votings. The approach was structured as a step-by-step iterative process, with five steps: steps 1 and 2 encompassed a preparatory stage where legally stated MSP objectives were identified and coupled with potentially relevant indicators referred to in the MSP evaluation bibliography. Steps 3-5 consisted of the participatory part of the process: step 3 included a consultation of national and international MSP experts and practitioners to screen the original set of indicators, and provide quantitative and qualitative feedback on those indicators; the analysis and integration of these results and findings yielded a refined list of indicators which was debated and ranked at a participatory workshop made up of Portuguese MSP practitioners and other MSP related agents and stakeholders (step 4); in step 5, feedback on these results was sought from the heads of the Portuguese agencies (national and regional) responsible for MSP and from other interested stakeholders/public in the framework of a public session.

This process and the information produced therein, was the basis for the proposal of a mechanism to assess performance of Portuguese MSP (chapter 5).

This iterative approach was designed as an adaptation of the Delphi method or Delphi technique (Hsu & Sandford, 2007; Linstone & Turoff, 2002; Thangaratinam & Redman, 2005). While particular definitions and concepts vary among authors, the Delphi technique has been summarized as "a widely used and accepted method for achieving convergence of opinion concerning real-world knowledge solicited from experts within certain topic areas" (Hsu & Sandford, 2007, p. 1). It is broadly based on an iterative consultation process of a panel of experts until consensus is deemed to have been achieved. Across its various versions and applications, the Delphi technique is used as a means and method for consensus-building and for communication (Hsu & Sandford, 2007; Linstone & Turoff, 2002). The technique was adapted to fit the specificities of this research.

4.2. Step 1 – Identify adequate objectives

The first step involved the identification of the most appropriate source of objectives to assess performance of national MSP. From the three legal instruments available, namely, NOS 2013-2020, MSPM Law, and Decree-Law 38/2015, the latter, stating the objectives of (future) Marine Spatial Plans, emerged as the most appropriate level of analysis (Table 4.1 presents the set of objectives, abridged. For the full wording of the objectives cf. section 2.4. above, under *Decree-Law 38/2015*).

The ensuing analysis was restricted to objectives b) through to f), leaving out objective a) for two main reasons: i) the vague wording related to the strategic character of the objective; and ii) specific indicators are being developed for the evaluation of the NOS, directly related to its strategic and operational objectives, in the framework of the SEAMIND project (DGPM, 2015).

Table 4.1. Objectives of Portuguese Marine Spatial Plans (abridged from Decree-Law 38/2015).

a) Implement strategic development objectives established (…) namely in the National Ocean Strategy;
b) Promote the economic exploitation, sustainable, rational, and efficient of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change;
c)Spatially locate uses and activities to be developed in the NMS taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment;
d) Prevent or minimize eventual conflicts among uses and activities in the NMS;
e) Ensure legal certainty and transparency of the procedures entrusting the rights of private use in the NMS;
f) Ensure the use of available information on the NMS.

4.3. Step 2 – Pre-selection of indicators

Indicators were tentatively matched to objectives b) to f) (Table 4.1.). Such indicators were selected from a literature review of scientific and technical references on the evaluation of ocean governance initiatives. Particular attention was given to MSP and MSPlans, including the implementation of international conventions and commitments, such as the United Nation's Sustainable Development Goals (SDGs), particularly Goal 14, pertaining to the conservation and sustainable use of "the oceans, seas, and marine resources" (UNGA, 2015), and European Directives pertinent to maritime issues and sustainable development. A review of ocean monitoring commitments assumed by Portugal was also carried out to take advantage of areas of overlap, to avoid duplication of efforts, and minimize costs, with the objective of increasing the likelihood of the implementation of such a monitoring and evaluation mechanism.

Proposed indicators are presented in Tables 4.2. and 4.3. For every indicator a "factsheet" was produced to synthesise and systematise available information on the indicator (Annex II – example of one of the factsheets produced).

Table 4.2. Proposed indicators for objective b). GAV: Gross Added Value; GDP: Gross Domestic Product; References: [1]MAOT, 2010; [2]GRA, 2011; [3]GGKP, 2013; [4]UNGA, 2015; [5]GFCM, 2013; [6]UNEP, 2010/EC, 2011b; [7]OJEU, 2013; [8]SIC, 2013; [9]SCBD, 2011; [10]Governo de Portugal, 2014; [11]IOC-UNESCO, 2011; [12]UNEP, 2014; [13]IEEP, 2003; [14]EC, 2010; [15]EC, 2011c; [16]UNEP, 2006. *Monitoring planned or underway.

Indicator	**Unit**
1. Requests to use the national maritime space[1]	No.
2. Changes in the use of maritime space[1]	%
3. Private investment in the national maritime space[1]	€
4. Public and private investment in RDT by sector of maritime activity[1]	€
5. Contribution of maritime economic activities in the trade balance[1]	€
6. GAV by sector of maritime economic activity[1]	€
7. GDP/*capita* of coastal residents[2*]	€
8. Electricity generated from marine renewables[1*]	€/inh. %, GWh
9. New market niches explored and product diversification[1]	No./%
10. Trends in benefits that humans derive from ecosystem services: GAV in the Environmental Goods and services sector[3]	% GDP
11. Trends in benefits that humans derive from ecosystem services: employment in the Environmental Goods and services sector[3]	% total employment
12. Sustainability/quality certification schemes (fisheries, aquaculture)[4,5]	%
13. Green award certification (shipping)	No., %
14. Stocks at MSY (*Maximum Sustainable Yield*)[6*]	%
15. Stocks overfished[4]*	%
16. Unwanted catches& discards /catches landed[7]	%
17. Tourism figures for wildlife visitor attractions[8*]	No.
18. Benefit sharing with coastal communities[9]	-
19. Shipping density[10*]	-
20. Coastal & marine area protected[1*]	%
21. Degraded ecosystems restored[1]	%
22. Developments permitted impacting designated sites/species[8]	No.
23. Condition of Marine Protected Areas[8*]	-
24. Conservation status of marine mammals[8*]	-
25. Conservation status of marine birds[8*]	-
26. Environmental Status of the marine environment[1*]	MSFD
27. State of coastal and transition waters[1*]	WFD
28. Trends of invasive alien species[1*]	No.
29. Escapement of cultured species	No.
30. Marine trophic index[11]	-
31. Red List Index[12]	-
32. Status of target species[13]	-
33. Food chain impacts[13]	-
34. Greenhouse Gas emissions from maritime transport[14, 15*]	g/tonkm
35. Energy efficiency[16*]	-
36. Specific CO_2 emissions[14*]	g/tonkm
37. Plastic materials entering ocean[4*]	ton/y
38. Pollution incidents reported[8]	No.
39. Incidents of dumping at sea[8]	No.
40. Applications with waste/litter management plan/measures[8]	No.
41. Operational pollution from ships[16]	No.
42. Port waste reception facilities available[12]	%
43. Noise[10*]	-
44. People & goods affected by storms	%, No.
45. Losses from climate related events[11]	€

Table 4.3. Proposed indicators for objectives c), d), e), and f). [1]SDSN, 2015; [2]Ehler 2014; [3]SIC, 2013; [4]EC, 2010; [5]MAOT, 2010; [6]Ardron *et al*., 2014; [7]UNEP, 2014.

Indicator	Unit
Objective c)	
Marine areas and coastline with formulated &adopted ICM/MSP plans[1]	%
Zoning plans and regulations completed, approved & implemented[2]	%
Applications where there are potential impacts on a site designated for historical environment[3]	No.
Condition of sites designated for historical environment[3]	-
Monitoring & mapping of new historical environment sites discovered as part of a development[3]	%
Employment rate of population aged 20-64[4]	%
Employment rate in maritime sectors[5]	%
Objective d)	
Conflicts in the use of maritime space by type and frequency	No.
Reported navigational accidents as a result of a marine development (construction or operation)[3]	No.
Applications refused due to incompatibility with other marine uses[3]	No.
Applications where there are potential impacts on the marine environment as a result of infrastructure development[3]	No.
Objective e)	
Licenses refused	No.
Conflicting processes at one-stop-shop	No.
Access to data (allowing for peer-reviewing of scientific advice)[6]	% requests
Access to meeting documents[6]	% requests
Rules concerning the participation of civil society observers[6]	-
Access to compliance and performance measures[6]	-
Objective f)	
Existence of a system of annual update	-
Incorporation of knowledge into management plans	-

4.4. Step 3 – Indicator screening by experts

The 65 indicators resulting from the preceding step were screened through one-on-one expert interviews with key informants (Bernard, 2006). These key informants were selected from among national and international experts in the fields of MSP and/or planning evaluation, and included MSP practitioners, members of various branches of academia (biology, ecology, law, geography), experts on indicators, independent consultants, non-governmental organizations (NGOs). The initial group of experts was expanded by snowball sampling, where participants suggested the names of other experts (Bernard, 2006). The

total number of interviews was determined by a point of "theoretical saturation", where no significantly new information was being obtained (Bernard, 2006).

Semi-structured interviews were conducted as per standard social science protocol (Bernard, 2006; Oppenheim, 1992), and structured around a questionnaire for the ranking of the 65 indicators. An interview protocol/guide was designed (Bhattacherjee, 2012; Ritchie & Lewis, 2003) integrating the following main topics:

- Introduction: Brief description of the process (objectives, how we got here, next steps);
- Grading indicators: Guiding the respondent through the list of 65 indicators and asking him/her to grade indicators in terms of three criteria;
- Probing: i) Other indicators: asking for suggestions about other relevant indicators to an evaluation of MSP performance; ii) Process questions: how hard/easy was it to fill in this questionnaire); iii) Method: is this method appropriate to come up with suitable indicators of MSP performance.

Three pilot interviews were carried out to review aspects such as clarity, scope, and feasibility, and to incorporate any necessary improvements on the interview guide (Bernard, 2006; Bhattacherjee, 2012; Ritchie & Lewis, 2003). Based on the results of the pilots, various aspects of the questionnaire were improved: the objectives of the research were clarified, the presentation of the indicators was simplified, units were added to the indicators, and the criteria to rank indicators was reduced to only two and their meaning clarified. The final version of the questionnaire is included in annex III.

Potential interviewees were contacted by email to inquire after their interest in participating in this research. Upon their acceptance, the interview was scheduled. The questionnaire and indicator factsheets were then sent to participants, not for completion, but so they could prepare for the interview.

During the interviews, participants were asked to rank indicators in terms of relevance (direct link with policy objectives), and feasibility (operationalizing capacity) (Ramos *et al.*, 2004). They were asked to rank both criteria using a scale of 1 (low relevance or feasibility) to 3 (high relevance or feasibility). No answer or non-applicability were recorded as 0 (Coutinho, 2014). In the analysis of results, the most important indicators

should be the ones with a total score of six (sum of both criteria). Relevance was ranked as the main criterion, followed by feasibility. As mentioned above, the interviews included open-ended questions related to an overall evaluation of the methodology with the possibility to comment on proposed indicators and/or to propose additional indicators. It was assumed that the interviewees would guide the discussion towards topics of genuine concern.

Interviews took place in person or by telephone. All interviews were recorded (contingent on participants' permission) to enhance accuracy and completeness of the data record and later analysed for content.

Twenty-five interviews were conducted between December 2015 and March 2016. Annex IV lists the participants involved in this stage (institutions are included as reference, as interviewees participated in this study in their individual capacities). Table 4.4. shows the distribution of the main types of expertise of participants. In practice this is an artificial separation, as the fields of expertise of the majority of participants overlap various relevant topics for MSP, ensuring a diverse and substantiated set of views and opinions.

Table 4.4. Number of interviews in terms of the main expertise of the interviewees.

Type of expertise relevant for MSP	National	Internat.
MSP Practitioners	2	3
Accounting experts (indicators)	3	2
Academia (planning, law, marine environment)	5	1
Academia (marine planning and strategic thinking/evaluation)	3	1
Independent Consultants/NGOs	2	3

Quantitative results

Eighteen interviews yielded quantitative results for the indicators under scrutiny. Table 4.5. synthesises the indicator scoring results, retaining only, for objective b) (for legibility), the twelve indicators with the highest total scores.

Table 4.5. Synthesis of results: For each objective of Decree Law 38/2015 (Obj.), proposed indicators are ranked by relevance (Rel.) and feasibility (Fea.). Total classifications (Tot.) refer to a possible maximum of 108 points (had an indicator received the maximum score from all 18 interviewees). (For objective b) only the twelve indicators with the highest scores are shown).

Obj.	Indicator (unit)	Rel.	Fea.	Tot.
b)	Coastal & marine area protected (%)	46	44	90
	Private investment in the national maritime space (€)	45	42	87
	Gross Added Value (GAV) by sector of maritime economic activity (€)	45	39	84
	State of coastal and transition waters (WFD)	44	43	87
	Certified fisheries (%)	44	40	84
	Environmental Status of the marine environment (MSFD)	44	35	79
	Contribution of maritime economic activities in the trade balance (€)	43	37	80
	Changes in the use of maritime space (%)	43	31	74
	Public and private investment in RDT by sector of maritime activity (€)	42	33	75
	Requests to use the national maritime space (No.)	41	45	86
	Electricity generated from marine renewables (%, GWh)	41	41	82
	Certified aquaculture (%)	41	37	78
c)	Marine areas and coastline with formulated/adopted ICM/MSP plans (%)	51	44	95
	Employment rate in maritime sectors (%)	51	36	87
	Zoning plans and regulations completed, approved & implemented (%)	42	33	75
	Applications where there are potential impacts on a site designated for historical environment (No.)	39	38	77
	Monitoring & mapping of new historical environment sites discovered as part of a development (%)	39	27	66
	Condition of sites designated for historical environment (qual.)	39	19	58
	Employment rate of population aged 20-64 (%)	26	21	47
d)	Applications refused due to incompatibility with other marine uses (No.)	52	46	98
	Conflicts in the use of maritime space by type and frequency (No.)	48	27	75
	Applications where there are potential impacts on the marine environment as a result of infrastructure development (No.)	35	21	56
	Reported navigational accidents as a result of a marine development (construction or operation) (No.)	33	35	68
e)	Access to meeting documents (% requests)	32	17	49
	Access to data (% requests)	30	20	50
	Licenses refused (No.)	27	24	51
	Rules concerning the participation of civil society observers (Qual.)	24	13	37
	Conflicting processes at one-stop-shop (No.)	23	23	46
	Access to compliance and performance measures (No.)	23	8	31
f)	Existence of a system of annual update (Binary)	33	22	55
	Incorporation of knowledge into management plans (Quant.)	26	12	38

Figure 4.1. shows the results of the scores of the indicators proposed for objective b): absolute values for each of the criteria are presented in the primary axis (maximum possible score of 54), and the total score (sum of relevance and feasibility) of the 46

indicators is presented in the secondary axis (for a maximum possible score of 108, achievable if the eighteen interviewees had given the maximum grade of three to both criteria for that indicator). Despite criticising the large number of indicators proposed (cf. section below on the findings of the interviews), almost half the participants found it difficult to effectively reduce the number of indicators, by attributing the highest score to ¾ or more of the 46 indicators proposed. Based on these results, the twelve indicators for objective b) with a total score higher than 70 were retained (even if merged with other indicators or renamed). Remaining indicators were, nevertheless, also analysed in terms of the comments received so as to be adapted, merged with others or discarded.

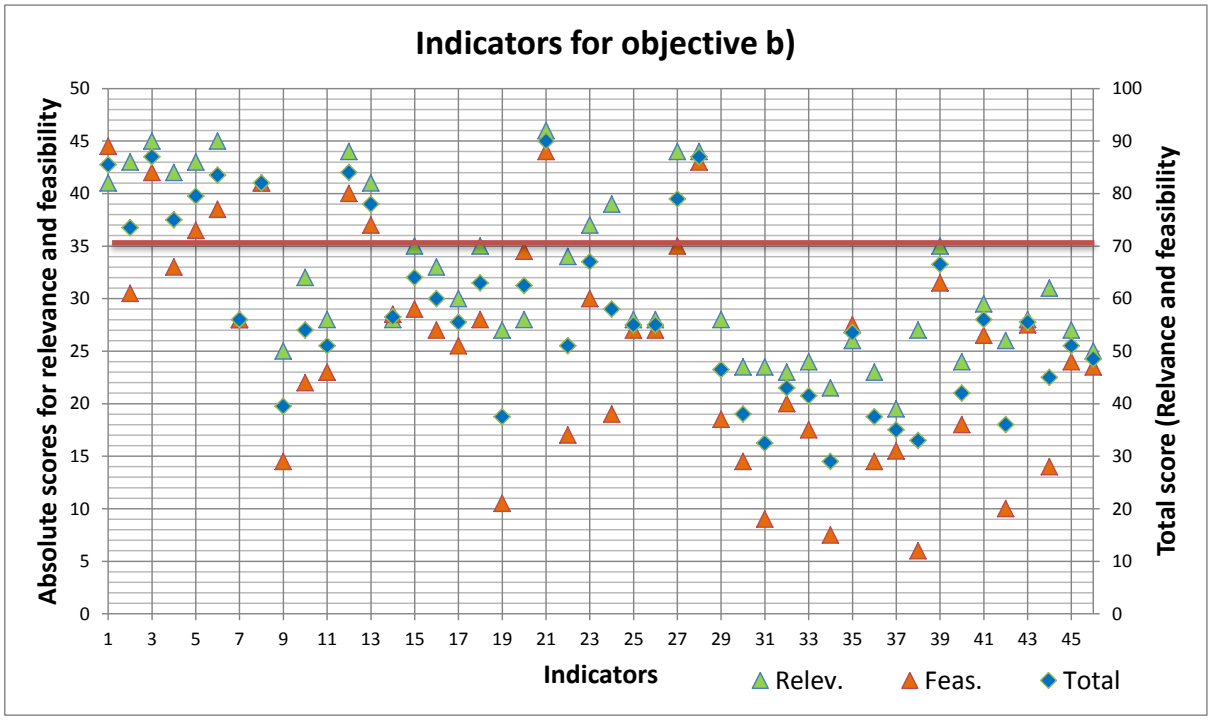


Figure 4.1. Indicators for objective b): absolute scores for relevance and feasibility (maximum possible score for each criterion was 54, and 108 for the sum of relevance and feasibility). The red line marks the threshold of the total score above which indicators were retained for further analysis.

Lower scores received by indicators, namely those relating to objectives e) and f) (Table 4.5.), reflect some degree of dissatisfaction with the indicators proposed, for being too broad or general. For all objectives a number of indicators were suggested by participants and integrated in the refined indicator set presented below (Tables 4.6. to 4.10.).

Qualitative findings

All the interviews yielded qualitative information, focusing on the relevance of the research, on methodological suggestions to fine-tune the focus of the evaluation, and on the simplification, development, and structuring of the preliminary set of indicators.

Relevance of the research

Most participants alluded to *the importance of this research*, and to its potential relevance in the evaluation of the implementation of the Portuguese marine spatial system. It was considered by a number of participants as an interesting, useful, and thorough approach, whose results might contribute to improve the quality of the national MSP process. One of the aspects highlighted was the potential usefulness of at least some of the indicators in international contexts.

Timing of the research

The timing of this research, specifically the focus on developing an indicator selection process before the completion of the marine spatial plan for the national maritime space, generated concerns among some participants. On the one hand, there were worries that the objectives of future Portuguese marine spatial plans stated in the law might be further detailed or even changed in the marine spatial plan (the Situation plan) itself, rendering the entire exercise futile. On the other hand, in the absence of management measures that will be contained in the plan, it was not possible to accurately derive appropriately detailed indicators, specifically indicators of efficiency.

For the first concern, three main reasons contributed to reassure participants: 1) the transient existence of allocation plans, which, upon approval, will directly integrate the situation plan, means that whatever objectives they pursue will have to be aligned with those of the situation plan; 2) the fact there will be one single plan (the Situation plan) for the entire Portuguese maritime space, instead of sub-national/regional plans (or even separate plans for the territorial seas and EEZs), legitimizes the assumption that the objectives of the actual plan will not differ significantly from the objectives stated in the law; and, lastly, 3) the fact that legal objectives of future Portuguese marine spatial plans are bonded by the strategic objectives of the Portuguese national ocean strategy 2013-2020,

which is itself grounded on the EU's Blue Growth model, further suggests that no significant deviation from legally stated objectives is to be expected.

The second concern (absence of management measures from which to draw more specific indicators) was also relativized by the majority of participants who believed that the definition of a broader evaluation framework with the corresponding set of high level indicators was useful and appropriate for this stage of the process, and could be refined at a later stage. Also for this reason, many participants commended this research on its timing, as an opportunity to jumpstart critical thinking about the evaluation stage beforehand, unlike current practice both nationally and internationally, and in a participated and collaborative fashion.

Method of indicator selection

Participants were generally favourable to *the method adopted* for the selection of indicators derived from legal objectives. Linking indicators to tangible and legally binding objectives was considered a sound approach by most participants. The main concern in this respect was the quality of legally stated objectives. Objectives, particularly objective b), but also objectives a) and c), were found to be "too long and complex", "too vague", and therefore "difficult to interpret" and "very hard to measure". The complexity of objective b), for example, led to different interpretations of its main purpose: while for some its focus is on economic exploitation, for others it is meant to evaluate efficacy of the implementation of MSFD and WFD. Signalling this difficulty in interpretation an MSP practitioner noted "your indicators will only be as good as how clearly articulated your goals and objectives in the plan are". Along the same lines, the option to exclude objective a) from the analysis was not consensual. While many participants agreed that it was a good option to leave it out as, due to its strategic nature, it was more unrelated to the specificities of marine spatial planning, and also because its phrasing was too broad to allow for the suggestion or identification of adequate indicators, others believed it to be the most challenging and found it important to retain, so as not to have an incomplete view of the objectives, and, potentially, as the right place to include aspects left out in the other objectives. Along these lines, some participants suggested that the focus of the analysis should be broader than, or not limited to, stated legal objectives, to allow the integration of other important aspects.

Comments, concerns and suggestions

Participants highlighted the usefulness of the indicator factsheets provided and the attempt to synthesize available information on each indicator.

In terms of the indicators presented, interviewees commented on the very large number of indicators proposed and on the unbalance in numbers of indicators among the various objectives, particularly for objective b). They recognized however, that the latter was a direct consequence of the difference in complexity of the objectives.

Interviewees generally recommended a reduction in the overall number of indicators – some suggesting an ideal number between three and ten indicators as a starting point, and then, as the MSP implementation process advances, adding indicators as necessary.

Many participants highlighted the need to focus on those aspects relevant to MSP, meaning those unique benefits and specificities of the process, or the issue of attribution – measuring aspects that are attributable to MSP so as to promote the concreteness and interest of the evaluation.

The importance of focusing on trends, and of establishing a reference framework with known baseline conditions and predefined, time-bound targets, was stressed by various participants, as was the importance of understanding each indicator, what its metrics really express, *i.e.*, what does it mean for it to have low of high values.

General concerns were also presented in terms of the temporal and spatial resolution of the indicators, including, for the latter, a careful consideration of the units in which the indicators are measured. These concerns stemmed from the sheer dimension of the Portuguese national maritime space, and the logistics behind maintaining regular data collection. Also, for such a vast maritime space, figures presented as percentages may disguise or obliterate important quantitative changes.

Participants highlighted the need to develop process level indicators (indicators of a streamlined regulatory process) and various participants suggested using the legal norms established in Decree-Law 38/2015 to allow a more straightforward and more concrete development of indicators, and render the evaluation system more meaningful to users.

Other aspects, not directly extractable from the objectives, or considered to be underdeveloped, were frequently highlighted by the interviewees:

- Participation, citizen's awareness: some measure of public participation and of the penetration of this topic in the social dialogue; ocean literacy; environmental and cultural education.
- Coherence with other planning systems, particularly the integration or connection of terrestrial with marine planning;
- Environmental impact assessment, cumulative effects, strategic environmental assessments: the importance of integrated assessments (with a push for SEA) and of using the precautionary principle;
- Benefit sharing (related to equity), including economic and non-economic benefits: distribution of costs and effects/benefits (who is paying, who is going to gain). Consider the value of a diversified portfolio of local livelihoods to be able to offer future generations opportunities to continue to derive value – maintaining options for the future. Robust array of opportunities; diversity;
- Quality of life, self-esteem, and well-being: Maintaining the cultural/spiritual value of the sea. Cultural appraisal and what values people derive that are not extractive: a narrative that talks about the importance of the sea for people, either limiting access or interfering with livelihoods; assessment of public and mental health: saving costs by promoting spiritual well-being (bringing intangibles to an economic argument).

Despite the subjectivity, the potential difficulty in establishing a direct link with MSP, and the estimated low feasibility of the latter two aspects, they were deemed important by a number of participants as metrics of the outcomes of MSP and its contribution to sustainable development.

Various participants highlighted the usefulness of using qualitative parameters to derive information through semi-structured interviews or questionnaires, to complement the evaluation. Such qualitative parameters can be useful when approaching more subjective topics (such as well-being) and even also more straightforward aspects such as the degree of satisfaction from users of the MSP system (such as the one stop shop), while more automated, quantitative evaluation mechanisms are not in place.

The majority of participants suggested the elaboration of an overall structure or framework to establish and clarify relations between indicators, rank and prioritise them, and avoid duplications or "double-counting". This could take the form of a logic model. The evaluation should be as simple as possible, sticking to those aspects relevant for MSP. Finally, participants highlighted the fact that an evaluation process also has to deal with phenomena not captured through indicators, and that there will always be areas of subjective interpretation.

Revised indicator set

The integration of these results and of participants' suggestions and recommendations yielded the 37 indicators presented in tables 4.6. to 4.10., which include an indicator code, name, measurement unit, and brief description.

The contribution of the sea economy to the Gross Domestic Product (GDP) (indicator B7) was proposed because it relates directly to one of the strategic objectives of the NOS 2013-2020 (to promote an increase of the contribution of the sea economy to the GDP by about 50% until 2020). However, the value of GDP as an indicator is being increasingly criticized, particularly because it "overlooks the contribution of natural assets to wealth, health, and well-being" (OECD, 2011, p. 10).

Objective f), related to ensuring the use of the available information on the NMS, was found by participants as one of the most important objectives but also one of the most challenging. The limited number of indicators proposed reflects this difficulty.

In this step the number of indicators was reduced to approximately half, while broadening the range of topics covered. Many of the suggestions raised by the experts were addressed, in terms of the incorporation of topics such as participation, coherence with terrestrial planning, environmental impact assessment, benefit sharing and well-being – elements deemed critical by participants in the determination of the sustainability of adopted options.

Table 4.6. Revised indicators for objective b): To promote the economic exploitation, sustainable, rational and efficient of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change.

Code	*Indicator*	*Unit*
B1	***Environmental status (ES) of the Marine Environment*** "Placeholder" of the results of the monitoring carried out under the Marine Strategy Framework Directive (MSFD). Any changes in the ES perceived as negative may act as warning signs prompting the adoption of corrective measures in the framework of MSP.	*Variable: MSFD*
B2	***Status of coastal and transition waters*** "Placeholder" of the results of monitoring carried out under the Water Framework Directive (WFD). Changes perceived as negative may act as warning signs prompting the adoption of corrective measures in the framework of MSP. Although the WFD applies to a minute fraction of the NMS, it is relevant as an indicator of pollution from land-based sources affecting the marine environment, and therefore, of land-sea interaction.	*Variable: WFD*
B3	***Requests to use the national maritime space*** Potential interest in the use of the NMS. It can be disaggregated in various more specific parameters	*No.*
B4	***Changes in the use of the national maritime space*** Fulfilled interest in the use of the NMS. Includes the percentage of common use which reverts to private use, be it for private activities or for public uses, such as nature conservation, and defence. It can be disaggregated in a number of more specific parameters.	*Area or %*
B5	***Condition of Marine Protected Areas (MPAs)*** The conservation status (*e.g.*, good, reasonable, bad) of all types of MPAs (Natura 2000, OSPAR, nationally protected areas, etc.). Intended as a measure of the effects of the management of the NMS in preserving natural values	*Qual.*
B6	***Investment in national maritime space (public and private)*** Measure of intended or actual economic interest in the NMS	*€*
B7	***Contribution of the sea economy to the Gross Domestic Product (GDP)*** Strategic objective of the NOS 2013-2020: By 2020 increase the direct contribution of the maritime sector to the national GDP by 50%.	*%*
B8	***Gross Added Value (GAV) by sector of maritime activity*** Provide a better understanding of the individual contribution of existing and emerging activities to the sea economy.	*€*
B9	***Authorizations for research or pilot projects*** The number of authorizations granted for research or pilot projects (eventually coupled with the number or fraction of such projects materialized in investment) is a measure of the interest in scientific research and technological development in the NMS.	*No.*
B10	***Ecosystem services – Well-being: cultural/spiritual value of the sea*** Measure of the importance of the sea in people's lives and livelihoods (including non-consumptive uses, such as leisure) and how MSP affects it, positively or negatively. It is therefore intended as a metric of how MSP relates to well-being in terms of cultural/spiritual value of the sea, and a proxy for the evaluation of this type of ecosystem services.	*Qual.*
B11	***Activities with sustainability certification*** No. or % of economic activities with sustainability certification, as it implies conformity with applicable regulations and patterns; proposed as an indicator of environmental sustainability.	*No. or %*
B12	***Measures revoked or amended due to incompatibility with MSP instruments*** Prevent risks of human action in the land-sea interface (Art 18, 35 of the DL).	*No.*
B13	***Sand extraction areas in the NMS to combat coastal erosion*** Metrics for an evaluation of how the land-sea interaction is tackled at the governance and planning level. Measure of efforts to minimizing effects of natural catastrophes and climate change	*M m^3 or km^2*

Table 4.7. Revised indicators for objective c): *To spatially locate the uses and activities to be developed in the national maritime space taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment.*

Code	***Indicator***	***Unit***
C1	***Area of the NMS with fully effective MSP*** Metric to evaluate progress of regional and national planning.	*Km^2 or %*
C2	***Area of the NMS which is protected*** Ensure preservation of natural values; Aichi target and UN Sustainable Development Goal of achieving a minimum of 10% of coastal and marine areas conserved by 2020.	*%*
C3	***Activities/unit area*** Measure of the coexistence of uses and efficiency in the use of the NMS.	*No.*
C4	***Processes of Environmental Impact Assessment*** Proxy of potential impacts on the marine environment generated by the activities under evaluation (Art. 23 of DL).	*No.*
C5	***Condition of sites designated for their underwater cultural heritage*** Qualitative measure of the effects of the management of the NMS on the conservation status of such sites.	*Qual.*
C6	***Employment in maritime sectors*** Offers insight into economic and social aspects of MSP. It should provide information not only on jobs created, but also on jobs lost (thus integrating a consideration of the effects of new uses over existing ones), and on the average qualification of workers.	*No. or % of total jobs*
C7	***Diversity of livelihoods related to the sea*** Assesses diversity of opportunities to sustain present and future generations. Envisioned as a measure of local social resilience, akin to the diversity indexes so often used in ecology.	No. or index

Table 4.8. Revised indicators for objective d): *To prevent or minimize eventual conflicts among uses and activities developed in the national maritime space.*

Code	*Indicator*	*Unit*
D1	***Conflicts in the use of the national maritime space by type and frequency*** Measure of real conflict between use types (common uses, common and private uses, and private uses) and frequency (sporadic, frequent, permanent).	*No.*
D2	***Requests refused for being incompatible with other activities*** Measure of conflict prevention.	*No.*
D3	***Relocation of existing uses or activities*** Measure of conflict minimization in the use of the NMS (Art. 28 e 29 of the DL). Includes the discrimination of uses relocated on grounds of public interest.	*No.*
D4	***Renunciation to the rights of use*** Number of renunciations to private use titles as a result of the relocation of a use or activity (Art. 28.4 of DL).	*No.*
D5	***Titles changed/altered by degradation of the environmental status*** If/how the degradation of the environmental status (under the MSFD) affects the activities taking place in the NMS (Art. 69. 1 of DL).	*No.*

Table 4.9. Revised indicators for objective e): *To ensure legal certainty and transparency of the procedures entrusting the rights of private use in the national maritime space.*

Code	*Indicator*	*Unit*
E1	***Titles decided by a public bidding process*** Measure of legal certainty and transparency of legal procedures, including publicity, and participation.	*No. or %*
E2	***Titles not granted to original applicant*** Measure of legal certainty.	*No.*
E3	***Revenue and use of taxes by type*** Monitors the correct application of the taxes applicable to marine activities, *i.e.*, assesses if and how such taxes are being used as intended to ensure ocean monitoring, conservation, and surveillance (Art.º 86.º and 99º of the DL).	*€*
E4	***(Public and private) costs of relocation or compensation*** Monitors the cost of relocating activities and who pays such relocation (whether it is public or private) (Art. 28 and 29 of DL).	*€*
E5	***Information requests*** Metrics of public participation and access to procedural information (Art. 7 DL).	*No. and %*
E6	***Fulfilment of procedural deadlines*** Related to predictability.	*No. or %*
E7	***User satisfaction*** Measure of legal certainty and predictability (*e.g.* through interviews), of procedural satisfaction of users, namely their length and cost (when applicable).	*Qualitative*
E8	***Complaints*** Measure of procedural conflicts.	*No. and %*

Table 4.10. Revised indicators for objective f): *To ensure the use of available information on the national maritime space.*

Code	*Indicator*	*Unit*
F1	***Existence of a geoportal on the national MSP system*** Existence of a single geoportal on the NMS, one which is accessible and updatable by the various relevant institutions. This indicator is also related to the objective of transparency.	*Binary (Y/N)*
F2	***Geoportal updates*** Contributes to evaluate the quantity of new information being used.	*No. or rate*
F3	***Existence of mechanisms of information sharing*** The existence of mechanisms of information sharing, particularly among national agencies relevant to MSP.	*Binary (Y/N)*
F4	***Measures incorporated in plans as a result of new information*** Measure of the actual use of available information.	*No.*

4.5. Step 4 – Indicator discussion workshop

The set of indicators resulting from the previous step of the analysis was debated at an expert participatory workshop. Participants were primarily selected from the list of experts interviewed during the first consultation stage (Step 3, presented above). The wide geographic distribution of the experts interviewed in the first stage as well as their busy schedules made it impracticable for all those interviewees to attend. Additional participants were thus invited from other fields of expertise to expand the range of perspectives present in the discussion, particularly NGOs and the private sector. A maximum of 21 participants was set (three tables each with seven participants and one facilitator).

The workshop was attended by seventeen invited specialists from national and international institutions including universities, agencies and NGOs (Table 4.11 and Annex V). Seven of them had participated in the round of expert interviews (41% of participants). Four of the specialists invited were unable to attend the workshop, including two professionals from the marine energy sector.

Table 4.11. Categories and numbers of participants.

National/international	Institution	No. participants
National	National agencies (MSP)	4
	National accounting bureau (indicators)	1
	Academia (incl. Azores and Madeira)	7
	NGO	2
International	Independent Consultants/NGOs	2
	Accounting (EEA)	1

The workshop was designed as an independent exercise where specialists participated in their individual capacities and not on behalf of their organizations. As such, their participation did not represent any type of commitment (institutional or otherwise) or endorsement of the results.

The workshop comprised three activities (prospective, discussion, and selection of indicators) whose methods and results are presented below:

Activity 1: Prospective – MSP and the sustainable development of the country.

Activity 2: Discussion and classification of indicators (groups);

Activity 3: Selection of the most important indicators.

Prospective: MSP and Portugal's sustainable development

To contextualize the ensuing discussion of indicators, participants were first asked to think about three questions of prospective:

- How does MSP contribute to the country's sustainable development?
- How should a correctly planned national maritime space (NMS) be?
- How do you envision national MSP to look like in 10 years?

Participants were distributed in three work groups (colour coded pink, blue, and green). A balance among the types of entities present in each group was sought. Participants were asked to answer individually to each of the questions listed above, by noting, on a post-it, up to three ideas that summarized their answer to each one. Then, they were asked to present their ideas to their respective groups, and to try to produce a group answer.

For each question, a sequence is presented below composed of: a sentence (in bold type font) summarizing the gist of the answers obtained; the narrative constructed to reflect the diversity of stated ideas; group answers. The wording tried to be as close to the original as possible, in order to reflect, as faithfully as possible, the views of the participants.

"How does MSP contribute to the country's sustainable development?"

Promoting balanced economic development, ensuring articulation/conflict management among activities, uses and functions, and fostering good ecological and environmental status.

The diversity of individual answers obtained suggests that MSP will render a greater number of concurring uses and activities compatible and foster the balanced development of each activity. It should ensure "limited" (non-abusive) uses within planetary boundaries, and it should be compatible (conflict-free) and socially fair, creating value through the integration of uses and activities (namely in the land-sea interface) while boosting the blue

economy. It should maintain the stability of traditional sectors, developing all the components related to conservation, leisure, and knowledge on the services/functions of marine ecosystems.

Environmental quality is the basic principle of access/use, ensuring a prioritization of uses with an "environmental" basis, instead of just an economic one (compatible uses or activities, respecting Good Environmental Status – GES). Based on the principle that the maintenance/promotion of ecosystem services is essential to the sustainable development of the activities in the long term, it must ensure nature conservation, and should accommodate, in the same plan, exploitation zones and important areas for conservation.

Through the organization of space and the allocation of the most suitable spaces to the different activities, and by managing and minimizing conflicts (use-use; societal), MSP should promote an integrated approach among intervening uses/activities and stakeholders. It should safeguard cultural/patrimonial heritage in a representative and significant way, identifying it spatially and evaluating its value (monetary and non-monetary), fostering growth and the sustainable uptake of the services provided, integrating them in accounting and in the economy. For this purpose, a transparent distribution of uses and benefits of the use of the NMS should occur, weighted in an environmentally safe and socially fair way, where activities with greater impacts and environmental risks are very limited or forbidden (*e.g.*, oil, mining, etc.). Awareness of populations should be raised on the importance and appreciation of the sea as a resource.

MSP should be based on better and more flexible knowledge, and adapt to new scientific knowledge. However, if these aspects are not materialized, instead of being a source of development, MSP can become a source of "degrowth". Table 4.12. summarises the answers of the groups to this question.

Table 4.12. Group answers to "How does MSP contribute to the country's sustainable development?"

Blue group	Pink group	Green group
Potentially, by: - Articulating uses and activities (integrated management: economic, social and environmental) - Compromise between State and private sector	- Representative/real respect for heritage - Development of the economy (in a sustainable way) and valuing (monetary and non-monetary) of ecosystem services - Transparency, knowledge and spatial representation	- Makes uses compatible - Promotes spatial planning - Manages conflicts - Promotes land/sea interaction and articulation

"How should a correctly planned national maritime space (NMS) be?"

Open and accessible to all, managed based on knowledge and on the principles of precaution, transparency, participation, integration (incl. land-sea), responsibility, equity, adaptive management and ecosystem-based management.

The importance of MSP being grounded on knowledge was the dominant answer of the participants. MSP should be based on solid information/knowledge (namely on existing activities and on ecosystems), allowing for scientifically robust decisions on use and vocation, prior to exploitation. Research and development (R&D) should be promoted, stimulating scientific research on the oceans, making Portugal competitive in this field on a worldwide level. This focus on knowledge should be associated with permanent monitoring and evaluation mechanisms, which allow flexible and adaptive management, with management guidelines for each activity so that each one is carried out in such a way that minimizes negative impacts and maximizes positive ones.

A correctly planned NMS should:

- Value public interest services (common good) so that the benefits of the use of common space/resources are distributed equitably between common and private interests;

- Ensures use and exploitation of marine resources within the boundaries of GES and/or precautionary approach, so as to maintain a high environmental quality capable of allowing any new uses, keeping the NMS appealing/attractive;

- Adequately balance the pillars of sustainability (economy, society, environment), balancing exploitation and exclusion/protection areas (namely for existing uses, respect for the seascape and areas of national interest), where greater cohabitation of uses (pressures) is in synch with the demands of GES, minimizing conflicts resulting from environmental pressures;

- Ensure correct land/sea link (integrated and coordinated with terrestrial planning, favouring the compatibility of uses and of marine and terrestrial spatial planning instruments), promoting articulated knowledge with the coastal zone, in harmony with and respecting the values of coastal populations (fishing, tourism, ...), even if of little relevance in terms of jobs and gross value added generated;

- Allow a "playing field" for private initiative, based on knowledge.

A correctly planned NMS depends on effective information and participation of current and prospective interested parties. GES is defined, discussed and monitored by a public and transdisciplinary mechanism (private sector, civil society, government, investors) simultaneous with the use of the NMS. It should be grounded on a solid knowledge base about the stakeholders (*e.g.*, national and regional authorities, exploitation services and companies, affected populations, NGOs) and on instruments and on an administrative organization that allows adaptive management and ensures transparency and the correct attribution of use titles (requires natural, human and financial resources).

Table 4.13. summarizes the answers of the groups to this question.

Table 4.13. Group answers to "How should a correctly planned national maritime space (NMS) be?"

Blue group	*Pink group*	*Green group*
Based on: - Profound knowledge - Adaptive management - Conflict minimization and integration of local communities	- Supported by strong knowledge base (monitoring/evaluation) - Fosters the public interest - Integration with terrestrial planning	- Openness and transparency

"How do you envision national MSP to look like in 10 years?"

Better, not very different from present, worse, unknown...

For some participants, in 10 years, marine spatial planning of the national maritime space will be better than at present, due to: the development/increment of traditional activities (still dominant); greater focus on new marine energy sources; greater weight of the ports component; greater relevance of a coherent network of marine protected areas (a structure to protect marine ecosystems that increases their resilience to climate change); growth and better planning of aquaculture (especially close to shore); greater materialization of uses outside the territorial sea; and better integration (namely in institutional terms). There will be increased implementation of cross border cooperation both in the framework of MSP, and of resource exploitation. It will be based on more robust information than at present, centralized in a GIS, integrating a wider array of factors and ecosystem analyses, and that includes all the information necessary for management and administration, and for private use requests, and that allows an efficient visualization of occupation/uses in the NMS. Probably, it will still be tilted toward the economic pillar.

For others, in ten years, national MSP will not look much different than it is at present. There will be more information but there will still be a lack of integration, despite greater qualification of technical staff for MSP.

Other participants envisage "MSP in ten years" negatively, where more activities correspond to more pressures. They anticipate an excess of private use, dominated by foreign companies with limited returns to the country, with risk of increasing the national ecological footprint for some of the nine planetary boundaries, and of increasing conflicts among some segments of society.

The importance of evaluation throughout the process was stressed by several participants, namely having uses adequately evaluated in environmental terms (effects/impacts), through Strategic Environmental Assessment (SEA) and more robust and encompassing Environmental Impact Assessments (EIAs). In 10 years, after the evaluation of the 1st generation of MSP, a 2nd generation is anticipated, integrating acquired knowledge[38].

At the level of the legal system, the need for a clear separation between planning and licensing legislation was stressed, as was the importance of guaranteeing equitable access to the NMS to all interested parties and of not having overregulation ("too much" law). Table 4.14. summarizes the answers of the groups to this question.

Table 4.14. Group answers to "How do you envision national MSP to look like in 10 years?"

Blue group	Pink group	Green group
- Far from optimum but better - Increased uses and pressures (namely outside the territorial sea)	- there is a 2nd generation of MSP that has incorporated lessons learned - Nothing has changed, except some technical qualification - More knowledge (which may or may not be integrated)	- Well equipped GIS (uses/space occupation) - Increment of traditional activities - Greater knowledge - Aquaculture - Little development of new activities (biotechnology) for lack of resources Vs. - Environmental risks - More activities - Greater environmental pressures - Substantial increase of private allocation of NMS

[38] According to articles 38 and 39 of Decree-Law 38/2015, the Situation Plan, which can only be revised five years after its entry into force, will be amended, *i.a.*, whenever allocation plans are approved or private use titles of the NMS are issued or cancelled. Thus, given the existence of mechanisms to dynamically update the Situation Plan, some participants questioned the appropriateness of referring to "generations" of MSP.

Indicator discussion and classification

This activity was the main indicator discussion exercise. For operational reasons, the five objectives under consideration were divided in three groups: objective b), related to economic exploitation, considered separately; objectives c) and d), related to allocation of uses and conflict prevention and minimization; and objectives e) and f), related to transparency and legal certainty, and with the use of available information (cf. tables 4.6. to 4.10 above). The indicators for each group of objectives were discussed separately in each table, and then rotated across tables, to make sure that all the experts discussed all the indicators. Total discussion time for each group of indicators (in every table) was, approximately, 45 minutes.

For each group of indicators, participants were asked to fill out an individual indicator classification sheet (Figure 4.2.), grading each indicator in terms of relevance (*i.e.*, pertinence of the indicator to evaluate performance of the Portuguese MSP system), and feasibility (capacity of the institutions involved to operationalize the indicator continually), using a scale varying from 0 (Not applicable) to 5 (very high relevance or feasibility).

Objective f) To ensure the use of available information on the national maritime space.

Code	Indicator	Unit	Relevance	Feasibility
F1	**Existence of a geoportal on the national MSP system**	Binary (Y/N)		
F2	**Geoportal updates**	No. or rate		
F3	**Existence of mechanisms of information sharing**	Binary (Y/N)		
F4	**Measures incorporated in plans as a result of new information**	No.		

Figure 4.2. Example of individual indicator classification sheet. Blank lines were included to allow participants to propose and classify new indicators.

Participants could propose new indicators, which should also be classified in terms of the criteria mentioned above. Participants were also asked to add any comments pertaining to the indicators, namely their relation to a different objective.

Participants were then asked to, in groups, debate and classify the indicators using a group classification sheet that was passed around the different tables (Figure 4.3.), so as to allow groups to build on the results of previous reflection.

Objective f) To ensure the use of available information on the national maritime space.

			Group 1		Group 2		Group 3	
Code	*Indicator*	*Unit*	*Rel.*	*Fea.*	*Rel.*	*Fea.*	*Fea.*	*Exe.*
F1	***Existence of a geoportal on the national MSP system***	*Binary (Y/N)*						
F2	***Geoportal updates***	*No. or rate*						
F3	***Existence of mechanisms of information sharing***	*Binary (Y/N)*						
F4	***Measures incorporated in plans as a result of new information***	*No.*						

Figure 4.3. Example of group indicator classification sheet. Blank lines were included to allow groups to propose and classify new indicators.

Results of the group classifications are presented in tables 4.15. to 4.19. None of the originally proposed indicators was rejected, and there were new indicators proposed, which directly reflects their relevance to the participants. While some indicators were consensual in terms of their relevance (*e.g.*, B1, B9, D1), others generated a more diverse array of classifications (*e.g.*, C1, E7). For indicator C1 (Area of the NMS with fully effective MSP), one of the work groups found it very relevant as an indicator of a fully operational MSP system. The other two groups found it irrelevant for the objective under consideration, given its transitory nature (*i.e.*, once the Situation Plan is fully effective, the indicator is no longer useful).

Due to the methodology adopted – iterations across tables – new indicators proposed from the 2nd iteration onward, could only be voted in two tables. Thus, not all of the proposed new indicators were voted by all groups. For the same reason, some indicators proposed by the participants for a given objective replicate indicators that were proposed *a priori* under other objectives they had not yet classified. For example, proposed indicator B16 (surface of MPA), replicates indicator C2 (Area of the NMS that is protected); proposed indicator F5 (Disclosure of revenue and use of taxes) is identical to indicator E3 (Revenue and use of taxes by type); and indicator E9 (No. of relocations), duplicates indicator D3 (Relocation of existing uses or activities). Such repetitions reinforce the importance of these indicators for participants.

Table 4.15. Results of the classification of indicators proposed for objective b). Ind.: average of individual scores attributed by participants; Group results: Pink (P), Blue (B) and Green (G.). In light grey, indicators proposed by participants.* Remove or rephrase. N: No answer. Colours used as a visual aid to highlight classification results:

0	1 (0.5-1.4)	2 (1.5-2.4)	3 (2.5-3.4)	4 (3.5-4.4)	5 (4.5-5)	N or *

Code	Indicator	Unit	Relevance				Feasibility			
			Ind.	P	B	G	**Ind.**	P	B	G
B1	Environmental status of the Marine Environment	Variable: MSFD	4.9	5	5	5	3.6	3	5	2-5
B2	Status of coastal and transition waters	Variable: WFD	4.5	4	4	5	4.3	4	5	3-4
B3	Requests to use the national maritime space	No.	3.5	4	4	3.5	4.8	5	5	5
B4	Changes in the use of the national maritime space	Area or %	3.1	4	N	2	4.2	4	N	5
B5	Condition of Marine Protected Areas (MPAs)	Qual.	4.5	5	4	1-5	2.8	1	3	3
B6	Investment in the national maritime space (public and private)	€	3.3	4	5	2	3.7	3	4	3-5
B7	Contribution of the sea economy to the Gross Domestic Product (GDP)	%	3.5	4	3	1-4	4.5	4	4	3-4
B8	Gross Added Value (GAV) by sector of maritime activity	€	3.5	3	3	2-4	4.6	5	5	3-4
B9	Authorizations for research or pilot projects	No.	3.9	4	4	2-5	5.1	5	5	5
B10	Ecosystem services – Well-being: cultural/spiritual value of the sea	Qual.	4.0	3	4	0-5	2.4	1	3	0-2
B11	Activities with sustainability certification	No. or %	3.7	3	3	0-4	4.6	5	5	5
B12	Measures revoked or amended due to incompatibility with MSP instruments	No.	3.0	0	N	2-3	4.5	0	N	3-5
B13	Sand extraction areas in the NMS to combat coastal erosion	M m^3 or km^2	2.7	2	*	1-2	4.1	5	*	5
B14	Innovation	No. patents		3				5		
B15	Requests to access genetic resources	No. requests		3				5		
B16	Area of MPA (including Natura 2000)	km2		4				5		
B17	Mechanisms/provisions to react to the effects of climate change	Legal framework								
B18	Amount spent by the user in the recovery of natural values after the use	€								

Table 4.16. Results of the classification of indicators proposed for objective c). Ind.: average of individual scores attributed by participants; Group results: Pink (P), Blue (B) and Green (G.). N: No answer. Colours used as a visual aid to highlight classification results:

0	1 (0.5-1.4)	2 (1.5-2.4)	3 (2.5-3.4)	4 (3.5-4.4)	5 (4.5-5)	N or *

Code	Indicator	Unit	Relevance				Feasibility			
			Ind.	P	B	G	**Ind.**	P	B	G
C1	Area of the NMS with fully effective MSP	km^2 or %	2.6	0	0	4-5	3.0	0	0	3-4
C2	Area of the NMS which is protected	%	4.0	4	1-4	2-5	4.4	5	5	5
C3	Activities/unit area	No.	2.9	N	N	2-5	4.4	N	N	5
C4	Processes of Environmental Impact Assessment	No.	3.5	5	4	2-5	4.4	5	5	5
C5	Condition of sites designated for their underwater cultural heritage	Qual.	4.5	4	4	5	3.0	3	3	3-4
C6	Employment in maritime sectors	No. or % total employment	4.1	4	4	5	4.4	5	3	5
C7	Diversity of livelihoods related to the sea	No. or index	3.4	3	4	2-4	2.4	N	3	2-3

Table 4.17. Results of the classification of indicators proposed for objective d). Ind.: average of individual scores attributed by participants; Group results: Pink (P), Blue (B) and Green (G.). N: No answer. Colours used as a visual aid to highlight classification results:

0	1 (0.5-1.4)	2 (1.5-2.4)	3 (2.5-3.4)	4 (3.5-4.4)	5 (4.5-5)	N or *

Code	Indicator	Unit	Relevance				Feasibility			
			Ind.	P	B	G	**Ind.**	P	B	G
D1	Conflicts in the use of the national maritime space by type and frequency	No.	4.7	5	5	4-5	3.1	1	5	1-5
D2	Requests refused for being incompatible with other activities	No.	3.9	4	5	3-5	4.9	4	5	3-5
D3	Relocation of existing uses or activities	No.	3.7	4	4	3-4	4.5	5	5	3-5
D4	Renunciation to the rights of use	No.	2.9	3	4	0-2	4.5	5	5	5
D5	Titles changed/altered by degradation of the environmental status	No.	4.4	5	2	3-5	3.7	5	4	4

Table 4.18. Results of the classification of indicators proposed for objective e). Ind.: average of individual scores attributed by participants; Group results: Pink (P), Blue (B) and Green (G.). In light grey, indicators proposed by participants. N: No answer. Colours used as a visual aid to highlight classification results:

0	1 (0.5-1.4)	2 (1.5-2.4)	3 (2.5-3.4)	4 (3.5-4.4)	5 (4.5-5)	N or *

Code	Indicator	Unit	Relevance				Feasibility			
			Ind.	P	B	G	**Ind.**	P	B	G
E1	Titles decided by a public bidding process	No.or %	3.7	4	3	5	4.7	5	5	5
E2	Titles not granted to original applicant	No.	2.8	N	3	2	5.0	5	5	5
E3	Revenue and use of taxes by type	€	4.4	5	5	2-4	4.0	2	5	3-5
E4	(Public and private) costs of relocation or compensation	€	3.9	5	4	4	4.2	3	5	5
E5	Information requests	No. and %	3.9	5	4	4	4.5	5	5	5
E6	Fulfilment of procedural deadlines	No. or %	4.3	4	4	5	4.8	5	5	5
E7	User satisfaction	Qualitative	3.6	4	4	1	3.5	2	4	5
E8	Complaints	No. and %	4.1	4	5	3-5	4.5	5	5	5
E9	Relocation of existing uses or activities (D3)	No.			4	0-4			5	5
E10	Average duration of titles			3		4		5		5

Table 4.19. Results of the classification of indicators proposed for objective f). Ind.: average of individual scores attributed by participants; Group results: Pink (P), Blue (B) and Green (G.). In light grey, indicators proposed by participants. N: No answer. Colours used as a visual aid to highlight classification results:

0	1 (0.5-1.4)	2 (1.5-2.4)	3 (2.5-3.4)	4 (3.5-4.4)	5 (4.5-5)	N or *

Code	Indicator	Unit	Relevance				Feasibility			
			Ind.	P	B	G	**Ind.**	P	B	G
F1	Existence of a geoportal on the national MSP system	Binary: Y/N	4.0	5	5	2-5	5.0	5	5	5
F2	Geoportal updates	No. or rate	4.2	5	5	2-5	4.7	5	5	5
F3	Existence of mechanisms of information sharing	Binary: Y/N	4.7	5	5	N-4	3.7	5	3	3-5
F4	Measures incorporated in plans as a result of new information	No.	4.3	5	5	N-4	3.4	1	4	N-5
F5	Disclosure of revenue and use of taxes (E3)	Binary		5				5		
F6	Quality of geoportal's content	No. qualitative layers		5				4		
F7	Quality of information sharing mechanisms	Qualitative		5				3		

"Top ten" indicators

Each participant was given ten stickers and asked to place them on the group sheets in front of the ten most important indicators in his/her individual evaluation (cf. Meadows, 1998), regardless of whether or not they covered all the objectives considered.

The result of the voting is illustrated in figure 4.4. and in table 4.20. Sixteen participants placed a total of 154 stickers. Not all participants placed all of the 10 stickers allotted to them. Some participants placed more than one sticker on the same indicator.

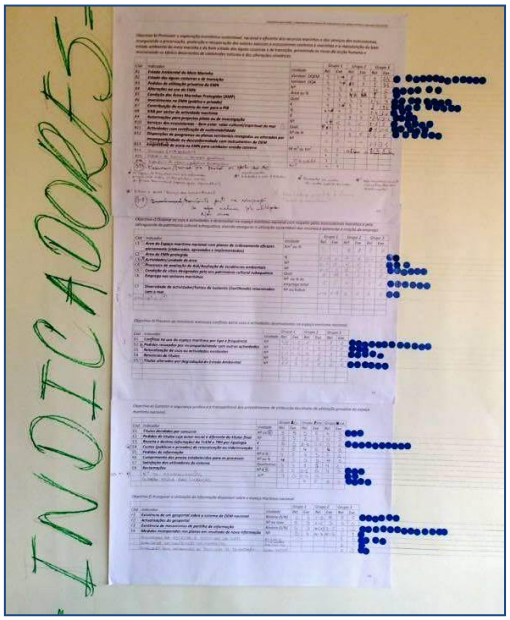


Figure 4.4. Results of the voting for the top 10 indicators.

Thirty indicators were selected by participants, including some proposed *a priori* and others added by the participants during the workshop, including some of the duplicated indicators mentioned above. The votes of duplicated indicators were added to obtain the results presented in table 4.20, where the resulting 28 indicators are ranked in descending order in terms of the number of votes they obtained.

Table 4.20. Results of the voting for the "top 10" indicators (**in bold type the 15 most voted**). Colours used as a visual aid to highlight relation of indicators to a given objective:

Obj. b) Obj. c) Obj. d) Obj. e) Obj. f)

CODE	INDICATOR	UNIT	VOTES
E3/F5	**Revenue and use of taxes by type**	**€**	**14**
B1	**Environmental status of the marine environment**	**MSFD**	**13**
F3	**Existence of mechanisms of information sharing**	**Binary (Y/N)**	**13**
D1	**Conflicts in the use of the national maritime space by type and frequency**	**No.**	**12**
B6	**Investment in the NMS (public and private)**	**€**	**9**
B5	**Condition of Marine Protected Areas (MPAs)**	**Qual.**	**8**
D3/E9	**Relocation of existing uses or activities**	**No.**	**7**
B3	**Requests to use the national maritime space**	**No.**	**6**
B11	**Activities with sustainability certification**	**No. or %**	**6**
C4	**Processes of Environmental Impact Assessment**	**No.**	**6**
C6	**Employment in maritime sectors**	**No. or % total jobs**	**6**
D5	**Titles changed/altered by degradation of the environmental status**	**No.**	**6**
F1	**Existence of a geoportal on the national MSP system**	**Binary (Y/N)**	**6**
B9	**Authorizations for research or pilot projects**	**No.**	**5**
B10	**Ecosystem services – Well-being: cultural/spiritual value of the sea**	**Qual.**	**5**
B8	Gross Added Value (GAV) by sector of maritime activity	€	4
E10	*Average duration of titles*		*4*
B7	Contribution of the sea economy to the Gross Domestic Product (GDP)	%	3
C3	Activities/unit area	**No.**	3
D2	Requests refused for being incompatible with other activities	**No.**	3
E1	Titles decided by a public bidding process	No. or %	3
E8	Complaints	No. and %	3
C2	Area of the NMS which is protected	%	2
C7	Diversity of livelihoods related to the sea	No. or index	2
F7	*Quality of information sharing mechanisms*	Qualitative	2
B4	Changes in the use of the national maritime space	Area or %	1
F4	Measures incorporated in plans as a result of new information	No.	1
F6	*Quality of geoportal's content*	*No. qual. layers*	*1*

None of the indicators received 16 votes, the total number of participants present at the time of the voting, suggesting that none of the proposed indicators is consensual. The seven most voted indicators totalled 49% of the votes. Since it was not possible to highlight the "top ten", as six indicators (in 8th place) obtained the same number of votes, the 15 most voted, corresponding to almost 4/5 of the votes, are

highlighted in bold type. It is also noteworthy that all the objectives are represented in the selected indicators and that the top four correspond to four different objectives.

Table 4.21. synthesizes the information relative to the top 15 indicators, namely in terms of their relevance and feasibility.

Table 4.21. Information relative to the 15 most voted indicators. Colours used as a visual aid to highlight relation of indicators to a given objective:

Obj. b) | Obj. c) | Obj. d) | Obj. e) | Obj. f)

Code	Indicator	Unit	Relevance				Feasibility			
			Ind.	P	B	G	Ind.	P	B	G
E3/F5	Revenue and use of taxes by type	€	4.4	5	5	2-4	4.0	2	5	3-5
B1	Environmental status of the marine environment	MSFD	4.9	5	5	5	3.6	3	5	2-5
F3	Existence of mechanisms of information sharing	Binary (Y/N)	4.7	5	5	N-4	3.7	5	3	3-5
D1	Conflicts in the use of the national maritime space by type and frequency	No.	4.7	5	5	4-5	3.1	1	5	1-5
B6	Investment in the NMS (public and private)	€	3.3	4	5	2	3.7	3	4	3-5
B5	Condition of Marine Protected Areas (MPAs)	Qual.	4.5	5	4	1-5	2.8	1	3	3
D3/E9	Relocation of existing uses or activities	No.	3.7	4	4	3-4	4.5	5	5	3-5
B3	Requests to use the national maritime space	No.	3.5	4	4	3.5	4.8	5	5	5
B11	Activities with sustainability certification	No. or %	3.7	3	3	0-4	4.6	5	5	5
C4	Processes of Environmental Impact Assessment	No.	3.5	5	4	2-5	4.4	5	5	5
C6	Employment in maritime sectors	No. or % total jobs	4.1	4	4	5	4.4	5	3	5
D5	Titles changed/altered by degradation of the environmental status	No.	4.4	5	2	3-5	3.7	5	4	4
F1	Existence of a geoportal on the national MSP system	Binary (Y/N)	4.0	5	5	2-5	5.0	5	5	5
B9	Authorizations for research or pilot projects	No.	3.9	4	4	2-5	5.1	5	5	5
B10	Ecosystem services – Well-being: cultural/spiritual value of the sea	Qual.	4.0	3	4	0-5	2.4	1	3	0-2

All but one of the indicators considered more relevant in the previous classification were retained in the present list, the exception being indicator C5 (Condition of sites designated for their underwater cultural heritage). Inversely, indicators classified as having medium to low relevance also showed up in this list and with a higher score than indicators classified as having “high” or “very high” relevance.

As to the feasibility of the different indicators, the understanding of the various participants was, perhaps, less consensual than for relevance (Cf. Table 5.20.).

Feasibility doesn't appear to be a paramount criterion in the choice of preferred indicators, as some of the more voted indicators were given low scores for feasibility by some groups.

4.6. Step 5 – Public debate session

With the indicator set resulting from step 4, a last round of feedback was sought. The main focus was on obtaining high-level institutional feedback from the heads of the main agencies responsible for Portugal's marine spatial plan – the situation plan. Another objective was to provide an opportunity of opening the debate to, and get feedback from, a wider audience.

A public session was organised to present and debate the top 15 indicators that had resulted from the workshop. The heads of the central (national) and regional agencies responsible for the situation plan were invited to participate and to comment on the results (Figure 4.5.). A report synthesising the workshop results was provided beforehand to the speakers to assist in the preparation of their interventions (Ferreira, 2016)[39].

The public session took place on June 7th, 2016, with an audience of c. 30 people. The top fifteen indicators were presented in terms of their relation to legally stated objectives (figure 4.6.).

[39] An English (abridged) version of the report was also produced. Both versions (Ferreira, 2016, 2016b) are available online at: https://www.researchgate.net/profile/M_Adelaide_Ferreira2/publications.

Figure 4.5. Programme of the debate session.

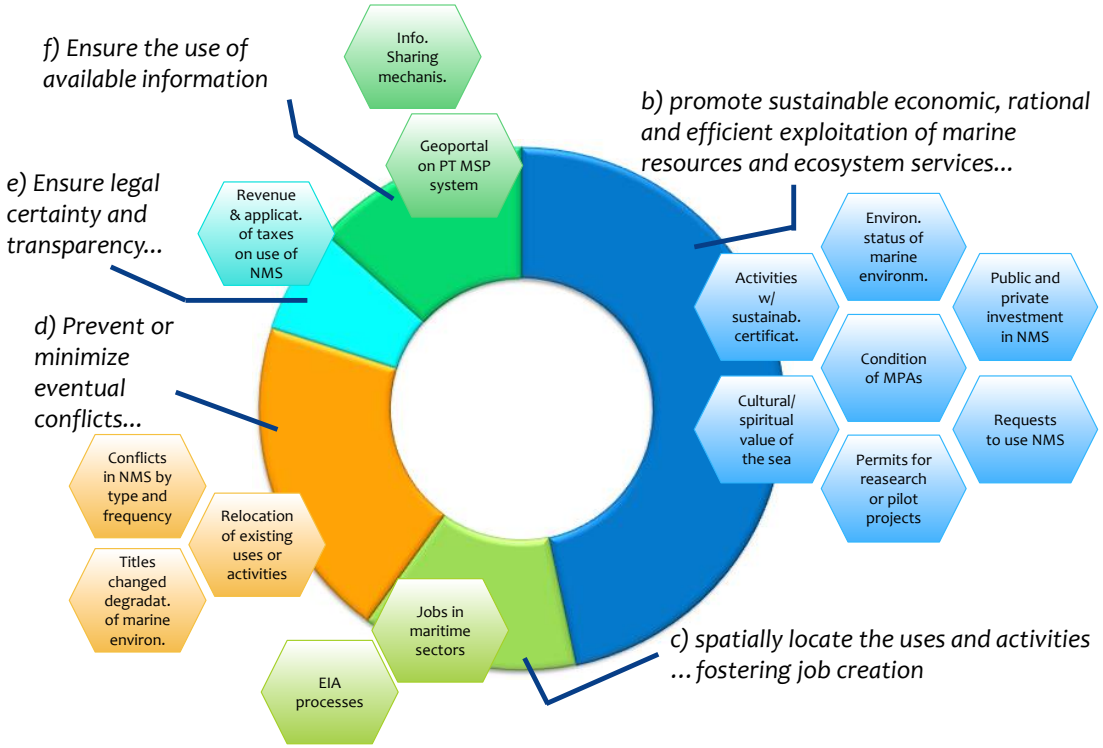


Figure 4.6. Top 15 indicators divided by objectives, as presented during the public session.

The indicators were also represented in terms of their relation to the agencies/ entities potentially involved in, or responsible for, providing the data (figure 4.7.):

- DGRM, the national agency responsible for developing the situation plan and in charge of all the monitoring under the MSFD, will centralize the information pertinent to 11/15 indicators;
- DGPM, the national agency responsible for evaluating the state of national MSP is, arguably, the most suited to collect information on the "cultural/spiritual value of the sea";
- APA, the national environment protection agency, centralizes the information on all Environmental Impact Assessment (EIA) processes;
- INE, the national accounting bureau, through the satellite account for the sea, is currently equipped to provide data related to employment in maritime sectors;
- The national maritime authority is the agency that centralizes information on actual conflicts in the NMS;
- SGS, or the appropriate certification company, houses information on activities with sustainability certification.

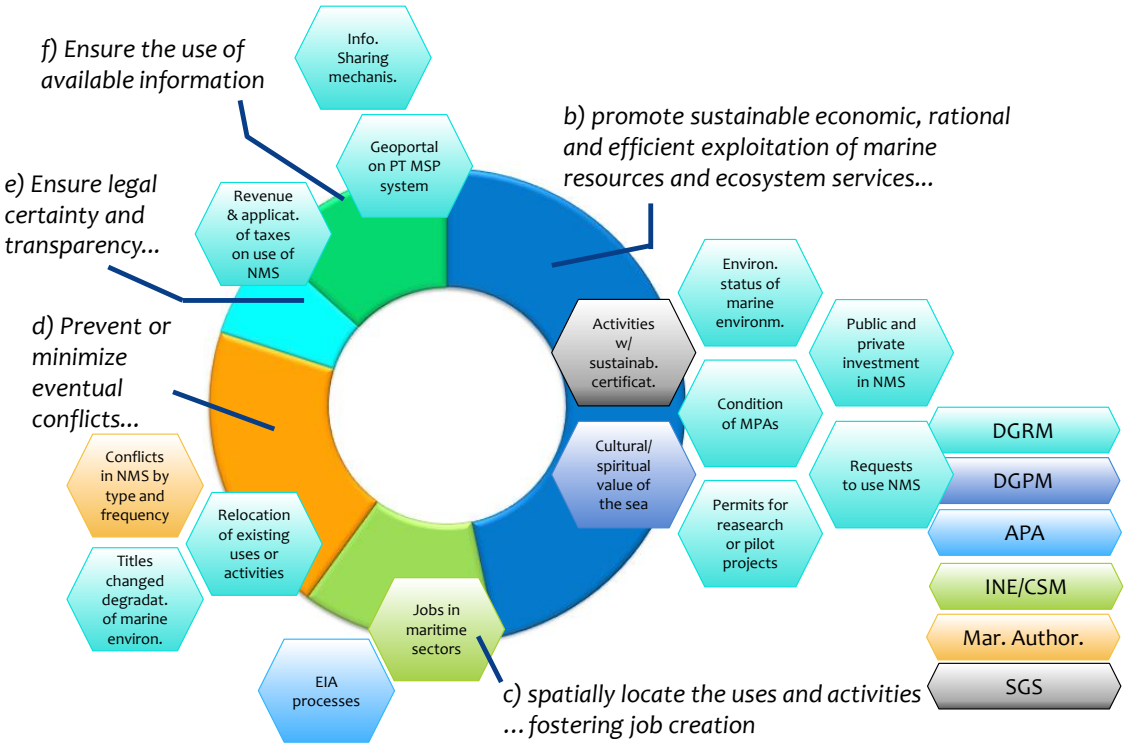


Figure 4.7. Top 15 indicators separated in terms of the potential information sources (agencies or entities that may provide the data for each indicator).

From the list of selected indicators, the "cultural/spiritual value of the sea" is therefore the only one that may require a specific investment for its evaluation as, arguably, the remaining 14 will be more readily accessible and/or already being monitored.

Three questions were asked to agency representatives:

- Do the agencies identify with these indicators;
- Is the adoption of these indicators adequate/sufficient to verify the achievement of the objectives of PT MSP instruments?
- As such, are they adequate to evaluate performance of PT MSP instruments?

The three speakers, the heads of the central (national) and regional agencies responsible for the situation, considered this to be an important, useful, and sound indicator selection process and generically agreed with and endorsed the indicators proposed, despite considering the possibility of adding further indicators either from the previous list of 37 or new ones.

The choice of using legally stated objectives as a concrete starting point for the definition on indicators was highlighted by the three speakers as a very positive aspect in the adopted approach. However, the fact that those legal objectives, as stated, require interpretation was considered a real difficulty in their application and their translation into indicators. One of the speakers interpreted the objectives as "composite", made up of the objective itself and of a set of constraints or conditions for its achievement. The fact that some activities are not considered in the Portuguese MSP legal framework with the corresponding potential to generate conflict was also alluded to.

The participative approach used in the indicator selection process, referred to by one of the speakers as "including society", was considered particularly important, especially in view of the goal stated in the National Ocean Strategy 2013-2020 of turning the Sea into a national goal. It was suggested that other agents, namely from the private sector, should be involved in the indicator definition/selection process.

The need for adequate base information and the dichotomy between available and needed information for the implementation of the indicators was highlighted.

A point was made on the need to rethink indicators that are not strictly dependent on MSP performance *per se*, such as the status of the marine environment, the condition of MPAs, and the evaluation of environmental impacts, which is dependent on legal requirements – the application of national EIA legislation, which dictates which projects are subject to EIA and which are not.

The implementation of an indicator related to the application of the use fee of the marine environment although deemed important was considered challenging to implement, due to a practical difficulty in tracking down the use of such funds within the administration.

Conversely, the geoportal and information sharing indicators were believed to be one single system, related to the implementation of the One-Stop-Shop, where the indicators can be housed and used.

Careful consideration to the integration of the land-sea interaction was also called for, as flaws in this integration can derive from MSP but also from terrestrial planning.

Main suggestions offered in terms of specific indicators were:

- Environmental status of the marine environment: focus and clarify the use of this indicator, and its relationship with the Marine Strategy Framework Directive;
- Cultural/spiritual value of the sea: widen the representation of ecosystem services in this set of indicators by broadening to other axes (protection, regulation, support);
- Develop indicators of legal certainty and transparency;
- Develop indicators related to governance.

Comments from the audience (mostly from MSP practitioners) reemphasised the appropriateness of adhering to legally stated objectives, and the need to clarify the use of the indicator related to environmental status and the marine strategy framework directive. More than one audience member restated the importance of

finding a strong indicator to link MSP and coastal management and strengthening the indicators for legal certainty and transparency. The interest of having indicators that might be useful in other MSP contexts or countries was also pointed out.

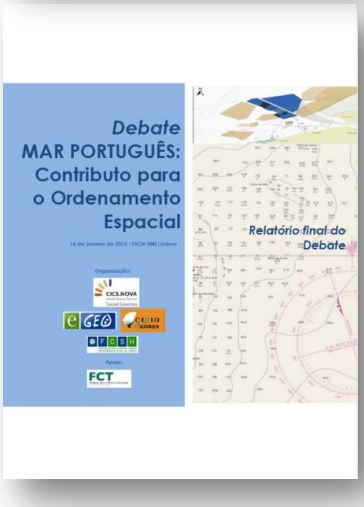
4.7. Dissemination/Communication of results

Throughout this study, because of the adopted methodology, there was a permanent focus on disseminating /communicating research results not only among the academic community but beyond, for other stakeholders related to the marine environment and to the wider public, both in Portugal and abroad. The objective was two-fold: i) to inform and contribute to raise awareness on the topic, and ii) to increase opportunities of receiving feedback on the research as it was being carried out. Other than eight research papers published in international peer-reviewed journals and in conference proceedings (both in English and in Portuguese), public debates were organized, and reports and newspaper articles produced (Figures 4.8. and 4.9.). According to the statistics offered by the website where the Workshop report is housed, the report had more than 100 reads during the first month after its publication.

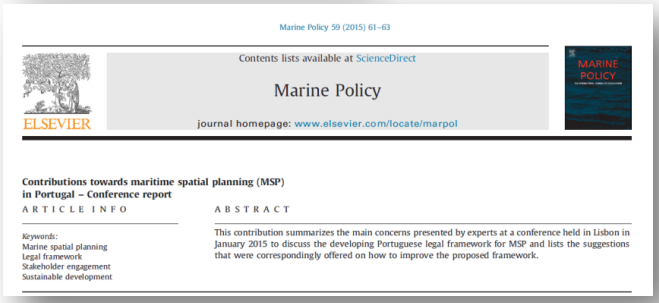
On the wake of the public session where the results of the participative workshop were presented and debated, an article was published in the online version of the Economy of the Sea gazette. The title read “Indicators are now available to evaluate performance of the MSP system”, testifying to the importance attributed to the process (Figure 4.10.).

Public conference (debate) on Portugal's developing MSPM legal framework
FCSH/UNL, 16.01.2015

Conference report sent to national authorities and made available online
31.01.2015



Main conference findings published in international peer-reviewed journal
(2015)



Main conference findings published in IBERMAR network newsletter and in O Propulsor (Journal of Portuguese Merchant Navy)
(2015)

Figure 4.8. Public conference on Portugal's developing MSPM system and ensuing dissemination of results.

Participatory workshop on Indicators to evaluate performance of Portugal's MSP system (invited experts) FCSH/UNL, 23.03.2016

Workshop report (PT and EN versions) made available online prior to public debate session 01.06.2016

Workshop results presented and discussed at EEAC Marine Working group workshop Brussels, 31.05.2016

Public session to present and debate workshop results with heads of agencies responsible for MSP FCSH/UNL, 07.06.2016

Figure 4.9. Participatory workshop on indicators to evaluate performance of Portugal's MSP system and ensuing dissemination of results.


JORNAL DA
Economia DO Mar

POLÍTICA & ESTRATÉGIA | DEFESA & SEGURANÇA | INFRA-ESTRUTURAS & TRANSPORTES | ENERGIA & RECURSOS NATURAIS | PESCA & INDÚSTRIA | CIÊNCIA E CULTURA

II GRANDE CONFERÊNCIA
BLUE ECONO
THE SALT OF THE EARTH

POLÍTICA & ESTRATÉGIA

Já há indicadores para avaliar desempenho do sistema de ordenamento do espaço marítimo

Indicadores foram comentados por responsáveis do ordenamento do território

Figure 4.10. Press coverage of the debate session held at FCSH/UNL in 07.06.2016. Online at http://www.jornaldaeconomiadomar.com/ja-ha-indicadores-para-avaliar-desempenho-do-sistema-de-ordenamento-do-espaco-maritimo/.

4.8. Chapter summary

This chapter presented in detail the five components of the step-by-step methodology designed for the development of an indicator system for the performance evaluation of Portuguese MSP, and concluded with the presentation and assessment of the dissemination/communication initiatives carried out during this study, which were one of the focuses of this research.

The results presented in this chapter are the foundation of the proposal and discussion presented in the next chapter, which is also informed by findings from the analyses presented in chapters 2 and 3.

Chapter 5 – Discussion

Includes results already published in:

Ferreira, M.A., Johnson, D., & Pereira da Silva, C. (2014). How can Portugal effectively integrate ICM and MSP? *Journal of Coastal Research*, *SI 70*, 496-501.

Ferreira, M. A., Andrade, F., Johnson, D., & Pereira da Silva, C. (2016c). How strategic is the Strategic Environmental Assessment of future Portuguese marine spatial plans in the European context? In J. Joanaz de Melo, A. Disterheft, S. Caeiro, R. F. Santos, & T. Ramos (Eds.), *Proceedings of the 22nd International Sustainable Development Research Society Conference (ISDRS 2016) – Rethinking Sustainability Models and Practices: Challenges for the New and Old World Contexts.* Volume 1 (pp. 78-85). Lisbon: FCT/UNL, CENSE, ISDR Society.

Ferreira, M. A., Andrade, F., Johnson, D., & Pereira da Silva, C. (2016d). Crescimento ou Desenvolvimento Azul no "Mar Portugês"? In N. Martins, J. Joanaz de Melo, A. Disterheft, S. Caeiro, M. Montaño, E. Moretto, T. B. Ramos (Eds.), *Livro de actas do 1º Simpósio Luso-Brasileiro sobre Modelos e Práticas de Sustentabilidade*, volume 2 (pp. 692-699). FCT/UNL, IEE/USP. Lisbon: CENSE/FCUL.

Ai Portugal,
Dar-te conselhos é bem pouco original
(mas) se realmente não quiseres querer-te mal
Olha p'ra ti, ó Portugal
E não te deixes assim vestir

(Oh Portugal,
Offering you advice is very unoriginal
(but) if you really don't want to wish yourself ill
Look at you, Portugal
And don't be accept to be outfitted like that)

Sérgio Godinho (1983)

Chapter 5 – Discussion

5.1. A framework for evaluating performance of Portuguese MSP

The process for the development of an indicator system to evaluate performance of Portuguese MSP described in the previous chapter showed that while it is important and useful to derive indicators from legally stated objectives, the resulting set of indicators may be incomplete if the objectives themselves are incomplete and/or fail to address important issues. The importance of including metrics to evaluate, *i.a.*, participation, stakeholder engagement, integration between land-sea planning, and other aspects pertinent to an evaluation of MSP performance not covered in the objectives stated in Decree-Law 38/2015, was repeatedly stressed by the experts (cf. more on Objectives below). These "missing" aspects are among the EU's MSP principles stated in the EU's MSP Roadmap and ensuing revision (CEC, 2008; EC, 2010b) (Table 1.2.).

Superimposing legally stated objectives of Portuguese MSPlans with the key principles of MSP as organised in the EC/DG-MARE 2011 study among inputs, process and effects, with the inclusion of the overarching principle of ecosystem-based management justified in section 3.3. (cf. Figure 3.5.) shows how those objectives are distributed among all types of principles and highlights those few other important aspects, not directly contemplated in the objectives that require further attention (Figure 5.1.).

From the integration of these aspects, and because of the very high degree of overlap between legally stated objectives of Portuguese MSP and EU MSP Principles, a framework for evaluating performance of Portuguese MSP can now be derived, where indicators are proposed in relation to MSP principles and their connected legally stated objectives of Portuguese MSP (Figure 5.2.). While primacy is given to the indicators favoured by the experts in the "top ten" selection exercise, others highlighted during the discussion are also included where needed. Because the focus of the analysis were high-level objectives (allowing, *i.a.*, for subjective interpretations), and the participatory method adopted for the development of the indicator system involved

various moments of stakeholder participation along its iterations , the information generated in the course of this research allows the proposal of this all-encompassing framework for evaluating performance of Portuguese MSP (Figure 5.2.).

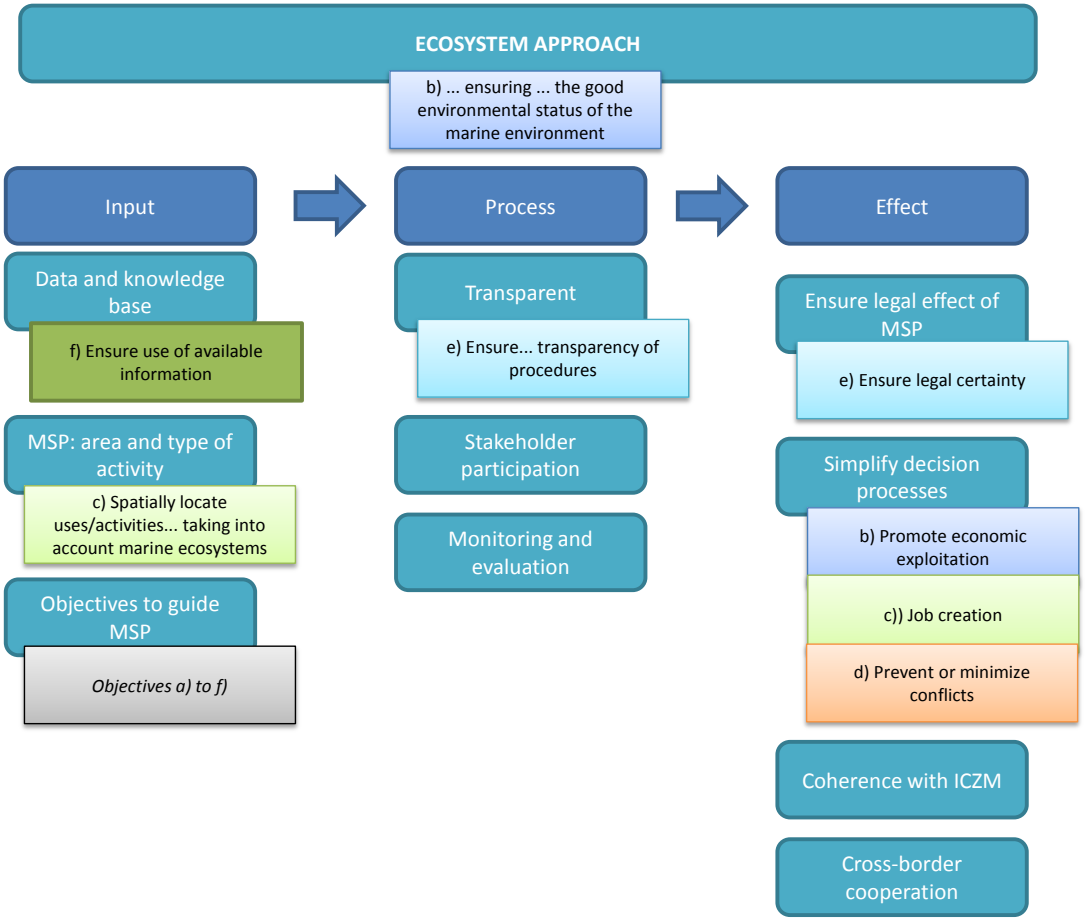


Figure 5.1. Legally stated objectives in DL 38/2015 (square cornered boxes) matched with the key principles of MSP (round cornered boxes) as organised among "inputs", "process", and "effects" in the EC/DG-MARE study (2011).

Over the next pages, indicators are presented and discussed for each principle, with information organised in factsheets (factsheet fields are explained in table 5.1.). After this discussion, a general simplified model for the evaluation of MSP performance is proposed. The discussion of MSP principles of "Objectives for MSP" and "Monitoring and evaluation", due to their central relevance to various topics, is distributed throughout the chapter in relevant sections.

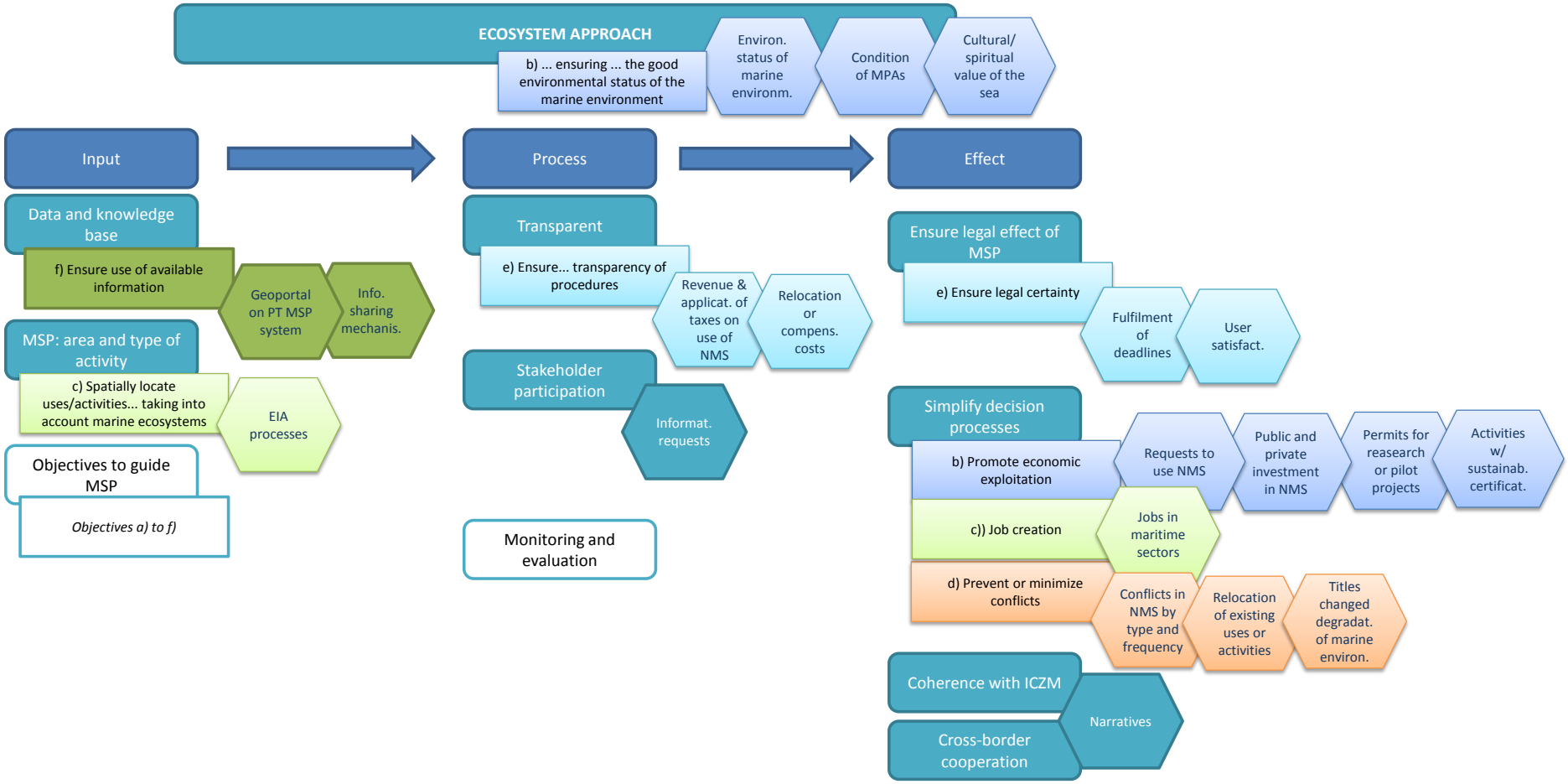


Figure 5.2. Proposed evaluation mechanism to assess performance of Portuguese MSP. Tentative distribution of indicators (hexagons) across the EU MSP principles (round cornered boxes) related to legally stated objectives of Portuguese MSP (square cornered boxes). The Principles "Objectives to guide MSP" and "monitoring and evaluation" are not presented in detail but discussed throughout the chapter.

Table 5.1. Elements of the indicator factsheets.

Principle	**EU MSP principle concerned**
Indicator	**Indicator designation**
Unit	Measurement unit
Link to objective	Link to a given legally stated objective of Portuguese MSP
Relevance	Justification of indicator's importance for the principle concerned
Target	Reference to desired indicator target (if available)
Reference	Instrument where such target is defined
Monitoring program	If there is an ongoing monitoring program or if it is new
Monitoring frequency	Frequency of sampling and data reporting
Data provider	Organisms that may provide information to feed the indicator
Entity responsible	Organism responsible for centralising information on the indicator
Comments	Any additional relevant information

While this research was built using the Portuguese legal framework for MSP as an example, the results and ensuing analysis demonstrate the applicability of the MSP performance mechanism proposed here in other contexts, with the necessary adaptations, *i.e.*, other coastal nations and their respective MSP process in the European Union, where these MSP principles are generally accepted, and potentially beyond.

Ecosystem approach

The EC Communication on the achievements and future developments of MSP in the EU established the ecosystem approach as "an overarching principle for MSP" recognising that "the ecosystem must form the basis of, the overall framework for MSP" (EC, 2010, p. 3). Three indicators are tentatively linked to the ecosystem approach, *i.e.*, to ecosystem-based management (EBM): environmental status of the marine environment, condition of Marine Protected Areas (MPAs), and well-being (cultural/spiritual value of the sea).

Environmental status of the marine environment

The environmental status of the marine environment (Table 5.2.) is perhaps the most complex indicator proposed here, for a variety of reasons. As mentioned before, the environmental status of the marine environment is to be determined on the basis of monitoring programs being implemented by every European coastal nation under the Marine Strategy Framework Directive monitoring obligations. Ongoing discussions, both within and among European countries, about which are the best indicators to assess Environmental Status of the marine environment and their actual meaning and

value, are beyond the scope of this research. As such, the specific indicators proposed by the Portuguese government in the MSFD monitoring and measures programs will be the ones used to determine the overall environmental status of the Portuguese marine environment.

Table 5.2. EBM – Environmental status of the marine environment factsheet.

Principle	**Ecosystem approach**
Indicator	**Environmental status of the marine environment**
Unit	MSFD (*i.e.* variable; depending on the specific component being monitored)
Link to objective	Related to objective b)
Relevance	Related to ecosystem-based management; the MSFD "provides the boundaries for human use of the sea's natural capital" and can thus "support determining the 'safe operating space' to allow Europe's maritime sectors to flourish"
Target	Achieve or maintain Good Environmental Status (GES) by 2020
Reference	EU Marine Strategy Framework Directive
Monitoring program	Portugal's MSFD monitoring program: MAM, 2014. *Programa de monitorização e programa de medidas da Directiva Quadro Estratégia Marinha*. Lisboa: 228p.
Monitoring frequency	Variable
Data provider	Various agencies
Entity responsible	DGRM
Comments	Ongoing monitoring for the 11 MSFD descriptors: (1) Biological diversity maintained. (2) Non-indigenous species at levels that do not adversely alter the ecosystems. (3) Populations of all commercially exploited fish and shellfish within safe biological limits (4) All elements of the marine food webs, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity. (5) Human-induced eutrophication is minimized. (6) Sea-floor integrity at a level that safeguards ecosystems' structure and functions (7) Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems. (8) Concentrations of contaminants at safe levels not giving rise to pollution effects. (9) Safe levels of contaminants in fish and other seafood for human consumption (10) Properties and quantities of marine litter do not harm the coastal and marine environment. (11) Introduction of energy, including underwater noise, at levels that do not adversely affect the marine environment.

This is a high-level indicator, which integrates many of the indicators that were proposed in the original list for objective b) (cf. Table 4.2.), and that directly relate to several of the eleven descriptors of the MSFD (Table 5.2), including: conservation status of marine mammals and birds (descriptor 1); trends of invasive alien species

(descriptor 2); stocks at MSY, stocks overfished, unwanted catches & discards/ catches landed, marine trophic index (descriptor 4); state of coastal and transition waters (descriptor 5); plastic materials entering ocean, port waste reception facilities available (descriptor 10); noise (descriptor 11) .

The MSFD is considered the environmental pillar of the EU's Integrated Maritime Policy and is perhaps one of the EU's strongest tools in the promotion of ecosystem-based management, as "it addresses all aspects of the functioning of marine ecosystems" (EEA, 2015, p. 192), including human pressures and impacts (OJEU, 2008). For the European Environment Agency, the MSFD "provides the boundaries for human use of the sea's natural capital" and can thus "support determining the 'safe operating space' to allow Europe's maritime sectors to flourish" (EEA, 2015, p. 192). In this respect, it can constitute an invaluable tool in any integrated evaluation exercise regarding ocean governance with a concern for sustainable development. Even if it can be hard to establish a clear and direct link between environmental status of the marine environment and the effects of actions carried out in the framework of MSP (*i.e.*, it can hardly be equated as a direct indicator of the performance of the MSP system), given the breadth of elements covered by its monitoring, and its spatial resolution, it can act as a warning light when environmental status deviates from a desired state. Lower level indicators, associated with the descriptors, can then provide pointers as to the causes of degradation.

Condition of MPAs

The condition of Marine Protected Areas (MPAs), while it receives dedicated attention in the framework of the Portuguese MSFD monitoring (MAM, 2014), is an important stand-alone indicator as MPAs are "key tools for securing ecosystem resilience and thus dealing with the uncertainties of our changing marine environment" (EEA, 2015, p. 192). Also, the link with MSP and its performance may be here easier to establish, and it is therefore intended as a measure of the performance (specifically, effectiveness) of the management of the national maritime space in preserving natural values (Agardy, 2015). In fact, "MPAs can be considered as small-scale models of ecosystem-based MSP" (Jones *et al.*, 2016, p. 262). These authors argue that "a shift to ecosystem-based MSP (…) could promote MPA networks as an

essential component of achieving both GES and sustainable blue growth" (*ibid.*, p. 263), reinforcing the importance of evaluating MPA condition in the context of MSP.

While total area of MPAs, with its associated international target of conserving at least 10% coastal and marine areas by 2020 (UN, 2015), is a quantitative indicator, simple to determine at any time by a direct query of a GIS system, condition is therefore a pressing and much more informative, albeit complex and ambitious, indicator of quality (Table 5.3.). In Portugal's case, this is a challenging indicator to monitor given the dimension, remoteness (not only distance from the shore but also depth) and current level of knowledge about these ecosystems. However, its implementation is of paramount importance, particularly in what concerns the establishment of baselines prior to the installation of new activities.

Table 5.3. EBM – Condition of Marine Protected Areas factsheet.

Principle	**Ecosystem approach**
Indicator	**Condition of Marine Protected Areas**
Unit	Variable
Link to objective	b)
Relevance	Related to UN SDG Goal14;
Target	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans
Reference	UN, 2015
Monitoring program	Included in the Portuguese Monitoring under the MSFD (MAM, 2014): MONIAMT – Monitoring maritime activities in coastal and ocean areas (Azores) FISH&SHIPS – Monitoring fisheries and maritime traffic in offshore MPAs (3 EEZs and Continental Shelf) MONIZEC – Monitoring the environmental condition of MPAs (proposed metrics include: habitat area; habitat volume (if relevant); condition of species and typical communities; relative abundance and/or biomass; physical, hydrological and chemical conditions; composition and relative proportions of ecosystem components (habitats and species).
Monitoring frequency	Variable
Data provider	Various agencies
Entity responsible	DGRM
Comments	Including Natura 2000 sites; Also used in the Shetlands' Marine Spatial Plan

Well-being: cultural/spiritual value of the sea

Recognising that humans are an integral part of the ecosystem (McLeod & Leslie, 2009; SCBD, 2004) it is key to have under the overarching principle of the

ecosystem approach, an indicator that offers some insight on the human component of the ecosystem. The "cultural/spiritual value of the sea" is conceived as a measure of the importance of the sea in people's lives and livelihoods (including non-consumptive uses, such as leisure) and how MSP affects it, positively or negatively (Table 5.4.). It is therefore intended as a metric of how MSP relates to well-being in terms of cultural/spiritual value of the sea, and a proxy for the evaluation of this type of cultural ecosystem services, which usually receive less attention in qualitative and quantitative terms than more "obvious" ones such as provisioning or regulating and maintenance (Liquete *et al*., 2013). Being potentially targeted at coastal residents, it can also provide an indirect measure of the relation and articulation of MSP with the coastal zone.

Table 5.4. EBM – Well-being: cultural/spiritual value of the sea factsheet.

Principle	**Ecosystem approach**
NAME	**Well-being: cultural/spiritual value of the sea**
Unit	Qualitative
Link to objective	b)
Relevance	Related to EU's 7th EAP vision for 2050
Target	In 2050, we live well within the limits of our planet
Reference	OJEU, 2013
Monitoring program	To be developed: surveys based on questionnaires or semi-structured interviews
Monitoring frequency	Variable
Data provider	To be determined
Entity responsible	DGPM (as the agency legally responsible for promoting the evaluation of the status of national MSP)
Comments	Intended as a measure of the importance of the sea in people's lives and livelihoods (including non-consumptive uses, such as leisure) and how MSP affects it, positively or negatively Organizations such as OECD are currently developing metrics of well-being which may provide concrete pointers for approaching this indicator.

Although a metric of this type was proposed by various experts, no concrete aspects relevant to its materialisation were offered, other than the possibility of conducting surveys based on questionnaires or semi-structured interviews producing mostly qualitative data or a narrative of subjects' (coastal residents and other stakeholders) perceptions of the importance of the sea in their daily lives. In the framework of OECD's Better Life Initiative, this organization is developing new metrics for measuring well-being and progress, based on a set of themes which include health status, environmental quality and subjective well-being (OECD, 2011, 2015, 2016). The Puget Sound Partnership has recently added a "vital sign" on human well-being, the

"psychological wellbeing index" based on "inspiration" and "stress reduction" (PSP, 2016). The research carried out by these organizations may provide useful pointers for approaching this indicator.

Data and knowledge base

Information and knowledge can be said to constitute the first enabling conditions for the existence of monitoring and evaluation. While the latter do not necessarily ensue from the former, it cannot exist if the information basis is absent. The two indicators "Existence of a geoportal on the national MSP system" and "existence of mechanisms of information sharing" can be considered binary (whether they exist or they do not exist), and hence they may be envisioned as having a transient existence: *i.e.*, once they are in place, they no longer need to be monitored. However, after such tools and mechanisms are in place it is vital to make sure that they continue to be updated and implemented. Also, it is important to recognise that they are interdependent, and that the existence of one is meaningless in the absence of the other (Table 5.5.).

These metrics also contribute directly to the objective of transparency not only in what concerns access by the public to information and decisions being made on the national maritime space (which is a public space) but also among different agencies.

Existence of a geoportal on the national MSP system

Existence of a single geoportal on the NMS (online database and GIS), one which is accessible and editable by the various relevant institutions – *i.e.*, any change inserted by any one agency is immediately visible by all other agencies. The goal is to have it permanently updated so as to serve as a reliable information base for timely decision-making. The interface of this geoportal for the public should allow queries, printing out information, and the opportunity to add information, through the use of comments or other tools. This information, after validation by the agencies, can be added to the geoportal. In this way, the geoportal can effectively allow and promote the gathering of information from a wider variety of sources.

Experience gained from the geoportal developed in the framework of the EU pilot TPEA (Transboundary Planning in the European Atlantic) project[40] may be useful and relevant in this case.

Existence of mechanisms of information sharing

The existence of mechanisms of information sharing, particularly among national agencies relevant to MSP, was deemed more important by practitioners then the existence of the geoportal itself. This results from a notion (sometimes vividly reported) of the current lack of such mechanisms and how it effectively impairs the work of the agencies. While information sharing mechanisms may in some instances need to be legally determined, improving communication among institutions and practitioners, particularly those involved in the various types of decision-making processes taking place in the context of MSP (permitting, licensing), may be one important step forward in promoting effective exchange of information. No suggestions were offered in terms of how this indicator can most advantageously be measured. In practice this may be tentatively assessed by cross-checking the percentage of data providers from the roster of public entities whose jurisdiction relates to MSP.

Table 5.5. "Data and knowledge" factsheet.

Principle	Data and knowledge
Indicators	Existence of a geoportal on the national MSP system Existence of mechanisms of information sharing
Unit	Binary
Link to objective	f) Ensure the use of the best available information on the NMS
Relevance	Enabling conditions for MSP
Target	Not defined. Can be stated as using state of the art information to base decision-making
Reference	-
Monitoring program	Not defined
Monitoring frequency	To be determined
Data provider	Various public and private entities with responsibilities in MSP
Entity responsible	DGRM
Comments	An evaluation of the existence of mechanisms of information sharing requires further development

[40] Cf. TPEA project website, online at: http://www.tpeamaritime.eu/wp/.

MSP by area and type of activity

As stated in the EU's Roadmap for MSP in respect to this principle, "management of maritime spaces through MSP should be based on the type of planned or existing activities and their impact on the environment." (CEC, 2008, p. 9). For this principle, one indicator is proposed.

Environmental Impact Assessment (EIA) processes

The EIA processes related to the development of projects in the NMS can be used as a proxy of potential impacts on the marine environment generated by the activities under evaluation (Table 5.6.) and may contribute to an assessment (or, at least, a better understanding) of cumulative impacts. This is directly relevant in the framework of the evaluation of allocation plans, in the framework of the licensing of uses or activities not considered in the Situation Plan (and, therefore, not contemplated in the Strategic Environmental Assessment). For environmental evaluation purposes, allocation plans are considered projects, and, therefore, subject to an EIA process in legally stipulated cases (Decree-Law 38, 2015, Art. 23).

Table 5.6. "MSP by area and type of activity" factsheet.

Principle	**MSP by area and type of activity**
Indicator(s)	Environmental Impact Assessment (EIA) processes
Unit	No.; Qualitative
Link to objective	c) Spatially locate uses/activities… taking into account marine ecosystems
Relevance	Proxy of potential impacts on the marine environment generated by the activities under analysis
Target	Not defined
Reference	Not applicable
Monitoring program	To be defined
Monitoring frequency	To be determined
Data provider	APA (the national EIA authority)
Entity responsible	APA (the national EIA authority)
Comments	May contribute to an assessment of cumulative impacts

One significant caveat is the underdevelopment of the current Portuguese EIA legislation (Decree-Law 1521-B, 2013) in what concerns projects to be licensed in the marine environment. The vast majority (about 90% according to one of the experts interviewed during this study) is not subject to EIA, including various "offshore activities with potentially negative impacts on the marine environment (…), namely (…) hydrocarbon prospecting, and wave-energy generation" (Guerra *et al*., 2015).

It is therefore important that this indicator reflects more than the sheer number of EIA processes, and is able to derive information from the decisions (environmental impact statements) on those projects.

Transparency

As recognised in the EU MSP Roadmap, "transparency is needed for all documents and procedures related to MSP. Its different steps need to be easily understandable to the general public. This will allow full information to all parties concerned and therefore improve predictability and increase acceptance" (CEC, 2008, p. 9). Although these various aspects could be explored within the subject of transparency, in the context of performance evaluation of Portuguese MSP (cf., *e.g.*, pointers in Ardron *et al*., 2014), the one that most experts were interested in was in knowing the fate of the taxes collected for the use of the national maritime space (Table 5.7.). As one expert phrased it: "knowing if and how the money collected in relation to the use of the sea is reverting to the sea". Two metrics are proposed and detailed below.

Table 5.7. "Transparency" factsheet.

Principle	Transparency
Indicator(s)	Revenue and use of TUEM (private use fee of the Portuguese NMS) Relocation or compensation costs
Unit	€
Link to objective	e) Transparency
Relevance	Important to foster credibility and acceptance of the MSP process
Target	Not defined
Reference	Not applicable
Monitoring program	To be implemented
Monitoring frequency	Every 2 years
Data provider	DGRM
Entity responsible	DGRM
Comments	Related to the implementation of norms established in Decree-Law 38/2015, specifically in article 86 (allocation of revenues obtained through TUEM), and in articles 28 and 29 (relocation of uses). Contributes to an assessment of equity

Revenue and use of taxes by type

This indicator, meant to monitor the correct application of the taxes applicable to marine activities, was collectively ranked by the specialists at the participative workshop as *the* most important indicator.

As mentioned above (cf. section on *Private use fee of the national maritime space*), the Decree stipulates that a proportion (37.5%) of the value collected by the TUEM (private use fee of the NMS) will be applied to fund activities to improve MSPM and the good environmental status of the national maritime space and of coastal/transition waters, and to fund and maintain maritime security services and monitoring systems (*Ibid.,* at Article 86).

As such, this metric assesses if and how such taxes are being used as intended to ensure ocean monitoring, conservation, and surveillance, in the terms of articles 86 and 99 of Decree-Law 38/2015, and, concomitantly, if they are sufficient to meet such needs.

It can also contribute to an assessment of the costs and benefits of Portuguese MSP, notably in what concerns a potential evaluation of the adequateness of the norm established in Article 76(2) of Decree-Law 38/2015, where activities related to exploration and exploitation of geological and energy resources, with potentially higher environmental impacts, are exempted from the payment of such a private use fee.

(Public and private) costs of relocation or compensation

Relates to the implementation of Articles 28 and 29 of Decree-Law 38/2015, concerned with the potential relocation of existing uses or activities (Art. 28) and with relocations on grounds of public interest (Art. 29). It specifically monitors the cost of relocating activities and the distribution of such costs, *i.e.*, who pays such relocation (whether public or private entities). This information can feed into the analysis of use-use conflicts, and contribute to an analysis of equity.

Stakeholder participation

Stakeholder participation is considered an essential component of successful MSP as a means of prompting synergies and innovation, of clarifying the goals and benefits of the process, of identifying conflicts and means of coexistence (EC, 2010). Though it is time consuming, it also promotes "a sense of ownership resulting from continuous involvement" (*ibid.*, p. 4). Stakeholder participation can and has been measured in a variety of different ways in different contexts. The available literature

offers plentiful guidance (*e.g.*, IUCN, 2004; Krick *et al*., 2005). In contexts where there is a culture of participation, it can be measured through numbers of meetings involving stakeholders, or no. of stakeholders involved (cf. Massachusetts' and Rhode Island's plans). In others where it does not exist, and Portugal is, unfortunately, in this second group, with very low levels of participation (Schmidt *et al*., 2013; 2014) such metrics may not be so meaningful. It is also important to recognise that while a difference is sometimes made between the general "public" and a narrower set of "stakeholders" within in, understood as "those who have an interest in or are affected by a decision (including) those who have influence or power in a situation" (NOAA, 2015, p. 3), when public issues are at stake, such as the management of ocean space and resources, all citizens are arguably stakeholders.

Within the Portuguese legal framework for MSP, Law 17/2014 refers to information and participation rights, stating that "all interested parties have the right to be informed and to participate on the elaboration, amendment, revision and suspension of the MSP instruments" (Article 12(1)), and guaranteeing "the participation of scientific, professional, union and business associations, directly or indirectly related to maritime activities" (Article 12(2d)) throughout the various stages of the planning cycle, and "the participation of interested parties through the process of public discussion" (Article 12(2e)). Decree-Law 38/2015 specifies that information rights comprehend, *i.a.*, the consultation of procedural elements, and information and clarifications requests (Article 7). Concerning participation rights, article 8 stipulates that suggestions and clarification requests can be filed throughout the various stages of planning and further consecrates participation during the public discussion period preceding plan approval. In that respect, the agency responsible for elaborating the Situation plan must "ponder the observations, suggestions and clarification requests presented by interested parties", during the public discussion period, specifying those cases where a substantiated response must be provided (Article 17).

As such, basic indicators conveying a measure of interest from the public in this process are proposed to ground an initial assessment (Table 5.8.) and to determine the need to promote awareness/participation campaigns.

Table 5.8. "Stakeholder participation" factsheet.

Principle	**Stakeholder participation**
Indicator(s)	Information/clarification requests Contributions from the public (observations/suggestions) Participation of stakeholder associations
Unit	No.
Link to objective	Indirect link to objective e)
Relevance	Measure of the interest of the public in the MSPM of the Portuguese NMS
Target	Not defined (Increase)
Reference	Not applicable
Monitoring program	To be implemented
Monitoring frequency	Not defined
Data provider	DGRM (the central MSP agency) and regional MSP agencies
Entity responsible	DGRM
Comments	

No. information/clarification requests

The number of information requests on the website/geoportal may provide a useful and practical pointer as a first indicator of interest by the public and access to procedural information (Decree-Law 38/2015, Art. 7).

No. contributions from the public

The number of observations/suggestions received from the public discriminated by the various stages of planning (Decree-Law 38/2015, Art. 8 and 17). The number of substantiated responses provided by the agency (Decree-Law 38/2015, Art. 17) or the percentage of responses to the total no. of contributions from the public may provide additional relevant information.

No. participations of stakeholder associations

The number of participations from stakeholder associations (ideally discriminated by the various stages of planning) (Decree-Law 38/2015, Art. 12 (2d)), may offer a first estimate of the participation/involvement of organised civil society.

Ensure the legal effect of MSP

In relation to this principle, the MSP Roadmap (CEC, 2008) alluded to the importance of legally binding MSP as a precondition for its effectiveness, and of an appropriate administrative framework. Legal certainty is one facet of this principle and, together with predictability, considered an extremely valuable element in MSP

(EC/DG-MARE, 2011) (Table 5.9.). The results of this assessment may determine the need to revise or streamline processes.

Table 5.9. "Ensure legal effect of MSP" factsheet.

Principle	Ensure legal effect of MSP
Indicator(s)	Average duration of titles Titles decided by a public bidding process
Unit	no. or %; qualitative
Link to objective	e) To ensure legal certainty
Relevance	Relates to predictability
Target	Increase
Reference	CEC, 2008; EC/DG-MARE, 2011
Monitoring program	To be implemented
Monitoring frequency	To be defined
Data provider	DGRM
Entity responsible	DGRM
Comments	Also related to the principles of transparency and coordination

Fulfillment of legally established procedural deadlines

A quantitative metric related to the fulfilment of procedural deadlines established throughout Decree-Law 38/2015 can be derived from the analysis of the state of processes in the online platform (the one-stop-shop), perhaps even through automated processes that can automatically keep track of "the state of affairs" along the process, eventually helping to identify bottlenecks.

User satisfaction

According to various practitioners, it is also recommended to complement this quantitative assessment with a qualitative one, on user satisfaction. The focus being on users of the MSPM system, not only the wider public but primarily investors and other relevant stakeholders, satisfaction can cover a variety of aspects such as length and cost of the processes, user-friendliness of the interfaces, availability and intelligibility of information, including cartography/maps, and legal norms and regulations. Again, this could be built into a narrative derived from the findings of questionnaires or semi-structured interviews of selected stakeholders.

Simplify decision processes – improvements in coordination

One of the expected consequences of improved coordination efficiency in governmental organisations is the acceleration of investments and economic growth (EC/DG-MARE, 2011). In terms of the objectives of Portuguese marine spatial plans

stated in Decree-Law 38/2015, this can be related to objective b), concerned with the promotion of economic exploitation of marine resources and ecosystem services (Table 5.10) and to objective c) in what concerns job creation (Table 5.11).

Four indicators related to objective b) are proposed below. In an analysis of results of this monitoring it will be important to keep in mind that external factors (such as the international context) may affect some of these indicators, namely the requests to use the NMS and the level of investment.

Requests to use the national maritime space

A measure of potential interest in the use of the national maritime space. It can be disaggregated into various more specific metrics such as:

- No. of requests/unit of time;
- Average area or average volume/request;
- Average duration of requests/title type (concessions, licenses or authorizations).

Focus can also be broadened to encompass an analysis of the fraction of requests that have been granted. Such an analysis can constitute an opportunity to evaluate aspects related to bureaucracy, governance, and demand.

Investment in national maritime space (public and private)

This indicator aims to provide a measure of intended or actual economic interest in the NMS. It should be disaggregated into at least two components:

- Public investment in the NMS (including public investment in developing and implementing MSP);
- Private investment in the NMS.

In what concerns private investment, it is important to differentiate between intended and actual investment, to assist in the determination of what intentions materialise in actual investments and actions. Although, by definition, “investment” implies the actual “act of putting money into something to make a profit” (Cambridge dictionary, 2016), and, as such, the notion of “intended investment” might appear to be a contradiction in terms, this aspect (concretely, “volume of investment”) is one of

the evaluation parameters proposed in Decree-Law 38/2015 (Article 27 (2c)) to aid in the selection of projects with "greater social and economic advantage for the country". Since this information will be drawn from project proposals, it will, in fact, constitute a case of "intended 'volume of investment'".

Authorisations for research or pilot projects

The number of authorizations granted for research or pilot projects is a measure of the interest in scientific research and technological development in the NMS. This may eventually be coupled with the number or fraction of such projects materialized in investment.

Activities with sustainability certification

No. or % of economic activities with sustainability certification, as it implies conformity with applicable regulations and patterns; proposed as an indicator of environmental sustainability.

Table 5.10. Coordination – Promote economic exploitation factsheet.

Principle	Coordination
Indicator(s)	Requests to use the national maritime space (no.) Investment in national maritime space (public and private) (€) Authorizations for research or pilot projects (No.) Activities with sustainability certification (No. or %)
Unit	Various
Link to objective	b) sustainable economic exploitation
Relevance	Measure of rate of increased interest in the NMS
Target	Sustainable economic growth
Reference	CEC, 2008; EC/DG-MARE, 2011; EC, 2012
Monitoring program	To be implemented
Monitoring frequency	To be determined
Data provider	DGRM
Entity responsible	DGRM
Comments	Indicators also proposed in the SEA of the POEM and in the POEM Importance of context in interpreting results of some of these indicators

Employment in maritime sectors

This proposed indicator offers insight into some economic and social aspects of MSP (Table 5.11.). It should include information not only on jobs created in the various maritime sectors, but also on jobs lost (also sectorally, thus allowing for a consideration of the potential effects of new uses over existing ones), and on the average qualification of workers.

While not all of these data may be readily available or formatted adequately to provide such information directly, INE, Portugal's national statistics bureau, has already developed a satellite account for the sea with information on various aspects of employment related to the sea (INE, 2016).

An interesting development would be assessing the diversity of livelihoods related to the sea (or to maritime activities), to help infer the diversity of opportunities to sustain present and future generations. As with the diversity indexes traditionally used in ecology, this metric would allow a measure, or at least an inference, of local social resilience.

Table 5.11. Coordination – Employment in maritime sectors factsheet.

Principle	Coordination
Indicator	Employment in maritime sectors
Unit	No., %
Link to objective	c) Foster job creation
Relevance	Socio-economic outcomes of MSP
Target	75 % of the population aged 20-64 should be employed
Reference	EUROPE 2020 headline target
Monitoring program	To be implemented
Monitoring frequency	Not defined
Data provider	National statistics institute: Satellite account for the Sea
Entity responsible	DGPM (as the agency responsible for the evaluation of MSP)
Comments	Proposed in the POEM Aspects to be contemplated: - Jobs created - Jobs lost - Average qualification of workers

Other expected effects of improved coordination are a reduction in the number of conflicts (EC/DG-MARE, 2011). In that report, conflict is defined as "a situation in which two or more maritime activities are incompatible and compete for the right to exist in a certain location (*ibid*., p. 18). Furthermore, it is recognised that "activities may conflict due to the impact one activity has on the other" (*ibid*.). The prevention or minimization of eventual conflicts among uses or activities in the NMS is one of the stated objectives of future Portuguese marine spatial plans (Decree-Law 38/2015, Article 4, 2, objective d)). Increased or unanticipated conflict situations during implementation may point to a need to revise certain measures or spatial allocation choices. The three conflict indicators that were selected during the analysis are

grouped here under one heading, as, in fact, the different perspectives they provide relate to the same topic (Table 5.12.).

Table 5.12. Coordination – Conflict factsheet.

Principle	Coordination
Indicator(s)	Conflicts in the use of the NMS by type and frequency Relocation of existing uses or activities Titles changed/altered by degradation of the environmental status
Unit	No.
Link to objective	d) Prevent or minimise eventual conflicts
Relevance	Contributes to one of the main objectives of MSP, conflict prevention
Target	Minimization of conflict in the NMS
Reference	Decree-Law 38/2015
Monitoring program	To be implemented
Monitoring frequency	To be defined
Data provider	Portuguese navy, VTS, EMSA; DGRM (depending on the parameter)
Entity responsible	DGRM
Comments	Relates to user-user and user-environment conflicts

Conflicts in the use of the NMS by type and frequency

Measure of real conflict between use types (common uses, common and private uses, and private uses). In a simple qualitative scale for conflict frequency, conflicts can be considered as sporadic, frequent, or permanent. It will be relevant to geolocate conflicts so as to be able to adaptively resolve such situations (including relocation).

Relocation of existing uses or activities

Measure of conflict minimization in the use of the NMS (Decree-Law 38/2015, Art. 28 and 29). Includes a discrimination of those uses relocated on grounds of public interest. This information will eventually be directly accessible from one-stop-shop records.

Titles changed/altered by degradation of the environmental status

If and how a potential degradation of environmental status (under the MSFD) affects activities taking place in the NMS. Art. 69. 1 of Decree-Law 38/2015 states that issued titles can be changed/altered whenever a change occurs in the circumstances prevailing at the time when the title was issued, and determining it, namely a degradation of the good environmental status.

It is important to note that this parameter deviates from a strict interpretation of the objective. The legally stated objective is aimed at the prevention or minimisation of eventual conflicts "among uses and activities in the national maritime space", *i.e.*, it is targeted at use-use conflicts, whereas this metric intends to go beyond the objective, broadening its scope, to grasp use-environment types of conflict. The focus here is not on the number of activities eventually losing their titles because of damage caused to the environment, but the reverse instead: how activities (and inherently economic development) can be impaired by environmental degradation (undermining the potential economic benefits of MSP).

Coherence with other planning systems and cross-border cooperation

These principles could also be referred to as (or grouped under) "articulation at the boundaries of MSP", as arguably similar challenges potentially exist when attempting to articulate different governance systems, such as MSP and ICZM, and MSP initiatives between neighbouring countries. During the interviews carried out in the course of this research, it was suggested that this topic was ideally framed to be tackled not by classical quantitative indicators but instead through a narrative constructed from the analysis of the answers to a group of questions.

Specifically in what concerns the articulation of MSP with ICZM, an exploratory study was already carried out, based on a set of seven questions (Ferreira *et al*., 2014):

- Are national policies/plans in place for the coastal zone and the ocean?
- Are ICM strategies in line with MSP policies?
- Are planning instruments for coast and ocean compatible?
- Are agencies responsible for ICM and MSP coordinated?
- Are there common goals/objectives between both types of policies?
- Are there common indicators? And if so, in what areas/fields?
- Is there scope for integrated measures?

While, in this case, the analysis was based on a review of existing legislation and plans, it could be advantageously supplemented with a set of semi-structured interviews to key respondents (practitioners and other stakeholders) related to marine

and coastal issues. The rationale here is that when the answer to the majority of these questions is affirmative, expectantly coherence is maximised, leading to streamlined processes and minimal conflict. Any other results should prompt the adoption of corrective measures to improve coordination.

One potentially interesting quantitative metric to assess this articulation in practice, will be the number or % of processes for the attribution of titles stopped or stalled due to ambiguities or vagueness in the definition of which spatial planning instrument it falls under: coastal or marine.

While the issue of cross-border cooperation was seldom presented as a concern by the experts interviewed in the course of this research. Results of the TPEA project (Transboundary Planning in the European Atlantic), particularly the evaluation framework developed therein using descriptive indicators assigned to evaluation criteria, may prove useful in this respect[41].

5.2. A general model for the evaluation of MSP performance

From the preceding analysis, it is now possible to propose a general simplified, basic framework for the evaluation of MSP performance where a core selection of the indicators discussed above can fit (Figure 5.3.). It takes the form of a basic dashboard with warning lights and a limited set of performance meters arranged according to the distribution of key principles of MSP into inputs, process, and effects – the vital signs of MSP performance.

Inputs refer to the existence of a working knowledge base and information. The equivalent to a navigation system that allows its user to physically know where (s)he is, the nature of the terrain, its morphology, the living and non-living components, and ultimately to chart its course. It is the basis of the ecosystem-approach to management.

[41] Cf. TPEA Evaluation report online at http://www.tpeamaritime.eu/wp/wp-content/uploads/2013/09/TPEA-Evaluation-Report.pdf. Accessed 28/10/2016.

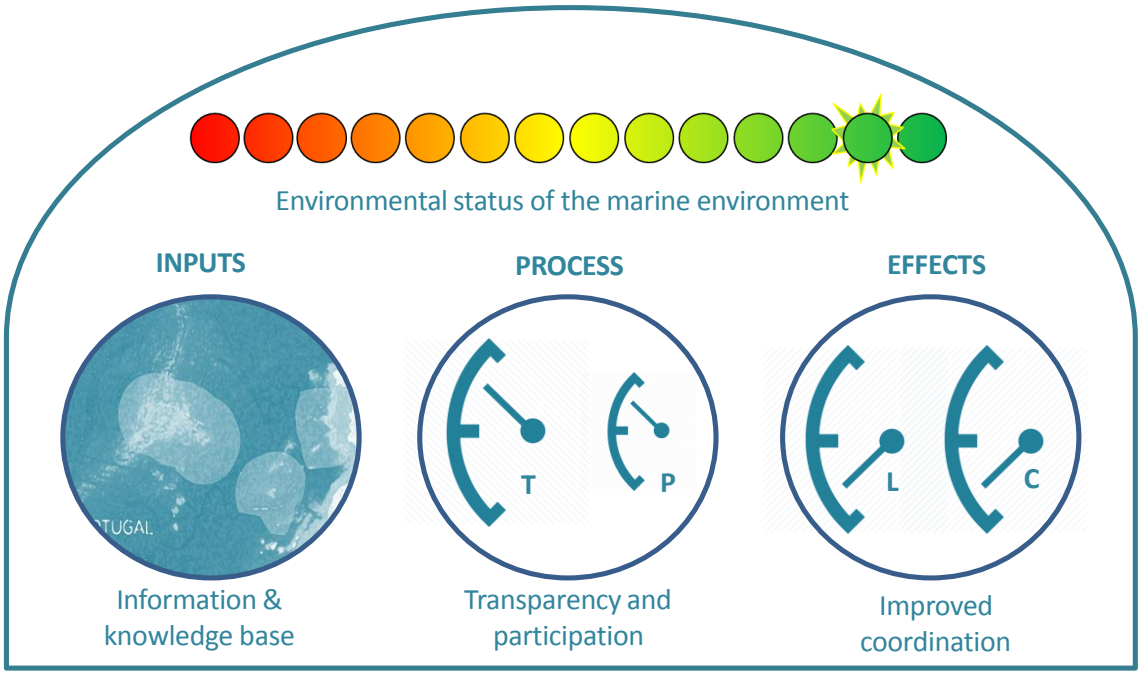


Figure 5.3. Simplified indicator framework for the evaluation of MSP performance. It takes the form of a basic dashboard with warning lights and various types of performance meters. T: Transparency; P: Participation; L: Licensing time; C: conflict. The upper meter gauges the status of the marine environment.

Evaluation of the process is gauged by the levels of transparency and participation, which should both be maximum. There is one important distinction between them, however, in that whereas transparency is directly linked and attributable to process performance, participation, as mentioned above, is, to a great extent, contextual (and therefore represented as a smaller dial). Participation is, however, included in the dashboard, to elicit, if necessary, the adoption of measures for publicising the MSP process, to promote public awareness on the process, and stimulate participation (Pereira da Silva, 2006).

MSP performance can be simplistically gauged by shorter licensing times and less conflicts.

Lastly, the "environmental status of the marine environment" gauge can be thought of as the "hot engine" warning light found in road vehicles, which warns about potentially serious malfunctions and is a sure indication to pull over. As already pointed out, it is extremely hard to find and establish an unequivocal causal link between MSP performance and the environmental status of the marine environment.

In such cases, the precautionary principle dictates that decisions and actions should err on the side of caution – hence, the need for this gauge.

As in motor vehicles, and their respective dashboards, various degrees of detail and complexity can be found, from the most basic to the most high-tech ones. For the first stages of evaluation, it is perhaps wiser, as so many experts suggested, to keep it as simple as possible. As time goes by, implementation advances and experience increases, more dials and degrees of complexity can be added. An assessment of the status of ultimate means (cf. Meadows, 1998), *i.e.*, remaining availability of natural resources over the course of their exploitation, and ultimate ends (sufficiency and well-being) could beneficially be added (*e.g.*, a dial in the dashboards indicating "user comfort").

5.3. Critical evaluation of the approach

In this section, a critical evaluation of the approach adopted in this research is carried out, noting perceived strengths (pros) and weaknesses (cons), highlighting also recognisable gaps, so as to inform and ideally improve a next stage/iteration of indicator development in the framework of the construction of an adaptive framework for evaluating the performance of Portuguese MSP.

Basing the analysis on legally stated objectives

The methodological option to take legally stated objectives of Portuguese Marine Spatial Plans as they were, without any critical examination or assessment of quality, and to use them to derive indicators, was generally considered by the experts involved in this study as a very interesting and useful approach, enhancing the practical interest and relevance of this research, maximising chances for its implementation, and, in the words of one participant, "putting an end to any excuses there might be for not implementing evaluation of MSP performance in Portugal".

In practice, this option raised significant difficulties for the indicator system development process. The phrasing of the objectives was considered dubious/vague by the experts analysing Portugal's legal framework for MSP (cf. section 2.5. and Ferreira *et al*., 2015b), and was perceived as a hurdle to the development of indicators

by those involved in the indicator system development process (cf. section 4.3. and Ferreira *et al*., 2016, 2016b). During the interviews and the participative workshop, numerous participants voiced difficulties in interpreting legally stated objectives. Particularly objective b), but also objective c), were found to be "too long and complex", "too vague", and therefore "difficult to interpret" and "very hard to measure". The most referred difficulty was the sheer complexity of objective b) which, interestingly, led to diverging interpretations of its main purpose: while for some its focus was strictly on economic exploitation, for others it was directed at evaluating efficacy of the implementation of the Marine Strategy Framework Directive and of the Water Framework Directive. Clearly, Portuguese legally stated objectives of Marine Spatial Plans are better equated to what Douvere and Ehler (2011) designated as "goals", *i.e.*, high-level "statements of intent or general direction" as opposed to "objectives" defined as "statements of measurable outcome" (*ibid*., p.309).

This option also generated concerns among a few experts. Signalling the difficulty in the interpretation of objectives, an MSP practitioner noted "your indicators will only be as good as how clearly articulated your goals and objectives in the plan are". Another expert was doubtful of the very interest of seeking indicators in relation to "such lofty goals", while still another suggested focusing this research instead on the definition of better objectives, as a way to assist in the construction of an improved legal framework. While these concerns and suggestions are legitimate and valid, the purpose of this research, from the onset, was to work with the legal framework as it was stated, the same way that any public official responsible for devising a mechanism to assess performance of Portuguese MSP would. As such, having high-level objectives justified, concomitantly, finding high-level or headline indicators (cf. section 3.2. on the various levels of indicators used by Eurostat). As MSP progresses in Portugal, with the concrete development of the Situation plan, and the definition of its objectives and management measures, other, more specific indicators will be derived.

Indicators

The indicators presented here are, therefore, mostly high-level or headline indicators related to high-level objectives, while others are more specific indicators derived from and related to provisions and measures included in the legal framework. Some aspects contained in the objectives were not fully covered by the indicators. The section of objective b) related to "preventing the risks of human action and minimising the effects of natural catastrophes and climate change" was not addressed, nor was "the safeguard of underwater cultural heritage" under objective c). These aspects, mainly those related to objective b), did not garner consensus among the experts involved or were deemed secondary. Therefore, they require further development. The effects of climate change on MSP is a pressing topic to consider (Frazão Santos *et al*., 2015), and relevant reflections on this topic may be found at Frazão Santos *et al*. (2016).

One positive aspect highlighted by the MSP evaluation experts involved in this process, was that of redundancy of some indicators (examples in this framework are transparency and participation). As in ecology, redundancy in evaluation is important to ensure resilience of the evaluation mechanism, allowing cross-checks on various aspects. It is important, though, that redundancy does not translate into double-counts so as to avoid artificially over-emphasising some aspects over others.

Recognising that the behaviour of an indicator may be dictated by a number of variables, the actual meaning of any indicator needs to be considered with a critical eye. Even in seemingly straightforward situations, such as fisheries, direct fishing pressure (captures) may not always be the sole cause of declines in fishing stocks, which may also result from natural environmental variations and/or from other anthropogenic causes such as pollution. As such, indicators may be seen as "mixels", in the remote sensing sense of "mixed pixels", where a given picture element (pixel), rather than corresponding to a "pure" land cover class, integrates various components (different land cover types). In fact, is it precisely because indicators often reflect complex realities and influences from various sources that their interpretation can become so complicated and inconclusive. In such cases, it would be useful to

quantify/weigh the proportions of different pressures on the behaviour of a given indicator so as to try to effectively highlight relevant causes.

In another example on MSP, what is the meaning, or potential significance, of having a small number of requests to use the NMS? Is it because of a poorly designed or inefficiently implemented MSP system? Or can it be a result of international context (and, therefore, independent of the performance of the MSP system)? And what information is there on the "quality" of those requests? *I.e.*, do they represent interest from, or potential development of, the most "desirable" activities (as defined, *e.g.*, in the National Ocean Strategy)? Such a critical examination is required in the analysis of every indicator.

As Meadows (1998) pointed out, when poorly chosen, indicators can cause serious malfunctions. She highlighted that the processes of choosing and using indicators are full of dangers or "pitfalls", including, overaggregation, measuring what's measurable instead of what is important, reliance on false models, intentional falsification of results, divert attention from own perception, overconfidence, incompleteness...

It is therefore of the utmost importance to keep a critical eye, knowing that indicators are only "partial reflections of reality, based on uncertain and imperfect models", and that the search for indicators is an "evolutionary" process, and one of learning (*ibid.*, p. 6). This learning process contributes to the meta-evaluation of the indicator system (Ramos & Caeiro, 2010), a critical analysis to be carried out during its implementation.

These indicators are not carved in stone. In the practice of the real world, some other indicators may be deemed more appropriate for any specific topics. Also, they are not eternal: while some currently important ones may lose their importance as time goes by and the process of MSPM implementation evolves, others should beneficially be developed, such as in the case of ecosystem services, including those related to well-being, while still others may arise that are not currently "in anyone's radar". By their very nature, these are dynamic, adaptive, and participated learning and management processes, ever evolving.

One key aspect to develop during the implementation will be that of baselines – the "starting point from which progress and success will be measured", *i.e.*, "a description of the state-of-the-system, based on the selected indicators, before any management actions (…) are implemented" (Ehler, 2014, p. 45). Although, as suggested by Ehler (2014), pointers for every indicator were offered in the indicator factsheets presented above to assist in that task, that will nevertheless be a challenging but critical task to undertake during the implementation stage of MSP.

Participatory indicator development process

The indicator development process included a significant component of participation of MSP experts, with the involvement, *i.a.*, of national stakeholders and MSP practitioners. This allowed for an effective discussion of several relevant aspects of MSP, including MSP evaluation, and potential indicators of MSP performance with some of the agents who will be directly involved in the implementation, monitoring and evaluation of MSP in Portugal. As stressed by various experts during this process and supported in the literature (*e.g.*, Carneiro, 2013; Ehler, 2014), involving MSP practitioners and stakeholders in the development of an evaluation mechanism (the planning of the evaluation) is critical: not only does it promote learning (by all the parties involved), it fosters buy-in of proposals, as practitioners and stakeholders are more likely to adhere to and implement the monitoring of indicators they have helped to define, and are, therefore, more likely to understand and identify with them. As such, the communication capacity of the indicators (one of the key objectives of indicators, cf. section 3.2. above) is also hopefully improved.

The perceived adequateness of the approach and usefulness of the results, garnered their broad endorsement by the heads of the three agencies (central and regional governments) responsible for implementing MSP in Portugal.

Although the intention was to maximise the range of stakeholders involved in the process, practitioners who would potentially use this experience and take advantage of the discussion, either in the development, implementation or evaluation of the Situation plan, it was not possible to include them all. The industry sector, for one, was not represented: two representatives from the sector were invited to the participative workshop but were both unable to come at the last moment. As in any

participative process, results reflected the perspectives of those involved. Would results have been significantly different had the industry sector been represented? Recognising this potential bias in these results may be useful for those directly involved in the development of the Situation plan and of its evaluation mechanism, should they want to take advantage of the proposals presented here.

Results from this research, specifically the findings of the prospective exercise presented in section 4.4., above, may also contribute to the evaluation of MSP performance in the framework of a "benefits realisation", *i.e.*, an outline of what users/stakeholders expect (giving substance to a better definition of objectives), against which MSP progress and delivery may then be evaluated (Gilliland, pers. comm.).

Further outreach and communication

As presented in section 4.6., one key focus of this research, associated to stakeholder involvement, was communication, *i.e.*, disseminating the information produced to a wider audience, encompassing stakeholders and the general public. In fact, when dealing with a public asset such as the ocean, arguably, every citizen is a stakeholder.

The main objective of this communication component was to contribute to inform the discussion of the developing Portuguese legal framework for MSP and to jumpstart thinking on its performance evaluation, even before the beginning of its implementation, in an attempt to break the vicious circle (cycle?) of planning in Portugal where the evaluation stage is systematically bypassed (cf. Figure 3.6. in section 3.4. above). Particular attention was given to offering timely information before and after public sessions (debates, workshops), so as to keep participants informed and engaged. In the preparation of the reports of these sessions, feedback from the participants was sought and integrated in the final versions, contributing to complete and validate these accounts.

Participants in the public sessions highlighted positively the opportunity to learn about this process, a feeling of participation and involvement they had not experienced before (stated even by public officials from agencies with a say in MSP),

the attention given to a constant check of the quality of this research as it progressed, and the possibility of using some of these results in their own work (also stated by public officials).

As such, while ensuring this outreach/communication component of the research was certainly time consuming, it contributed to substantiate and validate the findings obtained throughout the research, and, simultaneously, to a dissemination of the research topic to a wider public.

5.4. Implementing evaluation of MSP performance

Before the start of the next stage of MSP in Portugal, with the development, implementation, and evaluation of the situation plan, it is important to reflect on recent findings from the reality of MSP implementation internationally. Such findings, coupled with the results of the analyses of the Portuguese legal framework carried out earlier in this study, offer relevant pointers for the upcoming stages of implementation of Portuguese MSP, including performance evaluation.

The reality of MSP

MSP faces a number of challenges in how to translate principles into practice, namely in what concerns ensuring the sustainability of adopted options (Frazão Santos *et al.*, 2014; Qiu and &, 2013). As results of the implementation of MSP in reality start to appear in the literature, it becomes clear that MSP is at a crossroads. Not only the degradation of the marine environment continues, as "many indicators (…) suggest we are failing to effectively regulate and conserve vital ocean-based resources" (Ellis and Flannery, 2016), there are also worrying signs of mistrust among the various groups of stakeholders involved in MSP, and towards MSP itself:

- **MSP seen as a vehicle for the promotion of economic interests at sea**: MSP, at least as practised in EU member states, is perceived by NGO members, MSP practitioners and some members of academia as having an in-built bias towards the market forces that drive the economy" (Fairgrieve, 2016, p. 142); Agardy (2016) refers to "a pro-growth MSP agenda catalysing new uses and

expanding economies that endangers the values and the traditions of local people", ultimately to enable Blue Growth; this concern is mirrored in Jones *et al*. (2016) who refer to "a focus on blue growth at the expense of the health of marine ecosystems".

- **Governments and industries suspicious that MSP will negatively impact productivity and profits**: In some countries MSP is being resisted by state governments and some industries; one notable example is in the U.S., where, in recent years, the Congress has prevented funding for MSP for fear that "it will impose excessive regulatory control over ocean resources" (Torres *et al*., 2015, p. 200); The World Ocean Council (an international business alliance for corporate ocean responsibility) 2016 report on MSP recognised that "industry perspectives on MSP differ greatly" (WOC, 2016, p.4) and that, in fact, "the [marine planning] label itself may inject uncertainty and potentially unnecessary controversy" (*ibid.*, p. 12); In some places, Marine Protected Areas (MPAs), grounded on principles of MSP, "raise the (considerable) ire of fishers and tour operators (…) who feel legislated out of incomes and opportunities. Fisheries science is not enough to dethrone the on-going angst and real misery many stakeholders feel about marine conservation, their nemesis and, to them, the real 'fishy business'" (Nursey-Bray, 2016, p. 129).
- **Conservation (MPAs in the framework of MSP) as a means to maintain/sustain scientific research:** Some fishermen are doubtful of the true interests of researchers when promoting MPAs, perceiving academics as "the very ones who [begin] generating stacks of grant requests once the MPAs [are] implemented (…) making it appear that academia and other interests were fighting a political battle for personal financial gain" (Bacon, 2016, p. 146);
- **Participation mechanisms involving stakeholders and the general public being disconnected "by design" from the MSP decision process:** Based on findings on the monitoring and evaluation in twelve spatially managed marine areas in Europe (MESMA project), Jones *et al*. (2016) reported the predominance of top-down approaches and ad-hoc processes where "more participative [deliberative stakeholder] platforms (…) were 'disconnected by design' from the final decision-making platforms and processes", resulting in "apathy,

> disappointment and frustration amongst some stakeholders at the *ad hoc* and disconnected role of such platforms" (*ibid.*, p. 260-261).

Recognising these various aspects, some authors believe that "MSP is not a neutral or objective instrument to decide about conflicting claims" (van Tatenhove, 2016, p. 132). In fact, implementation is showing that in practice, instead of promoting integrated management "to achieve a diversity of ecological, economic and social objectives" many MSP processes "are initiated and driven by a specific sectoral objective (which is) the primary driver, main focus and over-riding priority of the processes, and any trade-offs and compromises are aligned to ensure that the strategic sectoral objective was achieved" (Jones *et al*., 2016, p. 259). These authors go as far as to propose that in such cases MSP should more accurately be defined as "strategic sectoral planning" *i.e.* "a process that focuses on the need to expand a particular maritime sector (…) in order to fulfil particular requirements and visions" (*ibid.*).

Such findings justify understanding MSP as "a power game" (van Tatenhove, 2016, p. 132) and help to explain the atmosphere of mistrust among stakeholders and between the public and specific stakeholders in relation to MSP itself. There is therefore a concrete danger that the practice of MSP may undermine the ultimate goals of MSP and effectively jeopardise/impair the potential of MSP as a "prime tool" for ecosystem-based management ultimately aimed to ensure sustainable development in the marine environment.

Recognising these pitfalls is the first step towards an improvement in the practice of MSP, striving to reduce or eliminate weaknesses and threats, while maximising its strengths and opportunities. As Knol and Jentoft (2016, p. 144) point out "we cannot do without MSP in an increasingly crowded sea", but there are calls in the literature for a "*radical turn* in MSP away from a rationalism of science and neoliberal logic towards more *equity-based*, *democratic decision-making* and a *fairer distribution of our ocean wealth*" (Flannery & Ellis, 2016, p. 121, emphasis added). That a practice of MSP based on equity, democracy and a fair distribution of the benefits and costs derived from the exploitation of the ocean commons can be deemed "radical" is simultaneously worrying and revealing.

MSP's contribution to sustainable development

It is useful to recall here some aspects of the European and international framework (including targets) relevant for MSP, with a focus on the Portuguese case in the EU context (Figure 5.3.). While the objectives of Europa 2020, and specifically Blue Growth in the marine environment are to be achieved by 2020, they have to reconcile with and contribute to sustainable development, converging to the fulfilment of the UN's sustainable development goals and the EU's climate and energy targets by 2030, to achieve the EU's vision of "living well, within the limits of the planet" by 2050. The implementation, for example, of Portuguese MSP must contribute to these medium to longer term goals and not just focus on the shorter term goals of blue growth, particularly because it will include the attribution of permits for the private use of the NMS that will be in place past 2050 (*e.g.*, a 50 year long concession attributed in 2016, may legally be in place until 2066).

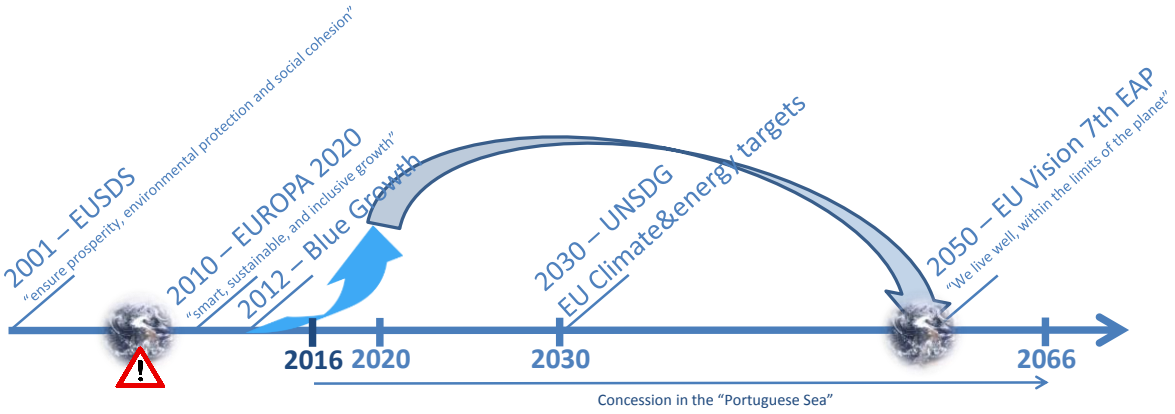


Figure 5.3. European and international framework and targets relevant for MSP in Portugal in the EU context. The exclamation mark over the Earth illustrates the notion of exceeded planetary boundaries.

It is relevant to note here that neither EUROPE 2020 nor the "blue growth" strategy were "subjected to some kind of environmental assessment, meaning that no holistic, prospective and long-term assessment has been carried to ascertain [if] the course they define [is] a significant contribution to the overarching aim of fostering and promoting sustainable development" (Ferreira *et al.*, 2016c, p. 82).

Since these prospects of growth are being fostered in a finite planet already exploited beyond the limits of its carrying capacity, some authors refer to "the EU's

euphemism of blue growth" (Ellis and Flannery, 2016, p. 123) while others believe that "it is much too late for sustainable development" (Lovelock, 2006, p. 3) and what is required is sustainable retreat or de-growth.

In the context of performance evaluation of MSP it is important to recognise the "different conceptualisations of sustainability which appear in ocean policies" and that the "measurement of progress or lack of progress towards sustainable development (SD) (…) requires critical interpretation and explanation of the conceptualisations of SD being applied" (Stojanovic & Farmer, 2013, p. 160, 164). These authors clarify that "the role of science in establishing progress towards sustainability cannot assume a unified theory, but must explicate rather than obfuscate the meaning of sustainability as it is reported in each endeavour" (*ibid.*, p. 162).

Portugal's responsibilities with MSP in approximately half the European maritime space (and a significant share of the global marine environment) means that the way in which Portuguese MSP is advanced (towards sustainable development) will inevitably have very significant consequences both in Portugal and abroad. The next stages of Portuguese MSP, specifically the development, implementation and evaluation of the situation plan and the performance evaluation of Portuguese MSP will be critically important in contributing to its success.

This research highlighted various aspects which can contribute to improve implementation/performance of Portuguese MSP:

Defining SMARTer objectives for Portuguese MSP

While, in theory, good objectives should be SMART (*Specific*, *Measurable*, *Achievable*, *Relevant*, and *Time-bound)*, in practice they rarely are (Day, 2008; Douvere & Ehler, 2011). To improve performance evaluation, at the very least, greater attention should be given to the writing of SMARTer objectives, addressing one or two of the components of SMART objectives (Ehler, pers. comm.). As MSP progresses in Portugal, the definition of its SMART(er) objectives for the Situation plan will be key. As highlighted above, the clarification of the concept of sustainable development

underlying the legal framework (cf. *e.g.*, examples of types of sustainable development concepts in Stojanovic & Farmer, 2016) will contribute significantly to improve performance evaluation.

While the Portuguese legal framework for MSP, including its stated objectives, is deeply rooted in the EU's blue growth development model (Figure 5.4.), a better definition of objectives, one which is truly strategic and adapted to the Portuguese case can also be beneficially developed in the framework of the Strategic Environmental Assessment of the Situation Plan (Ferreira *et al*., 2016c).

Figure 5.4. Hierarchy of European and national Portuguese instruments framing Portugal's MSP (Ferreira *et al*., 2016c).

Stakeholder engagement and participation

Engaging a diverse set of stakeholders and promoting wider public participation in the elaboration of the situation plan, specifically in the definition of plan's objectives, of management measures (including a better definition of criteria to choose between competing uses/activities), and of the evaluation framework, will contribute to improve equity, democracy and a fairer distribution of access to ocean commons for existing and intended uses and activities. This will further contribute to balance the power scale of MSP, threatened, in the Portuguese case, by a legal framework that promotes new uses over (if not not at the expense of) existing uses.

Similar practices have been found in the international praxis of MSP: the World Ocean Council reported on findings showing that "the biggest gains in economic terms went to new users (and that) losses were concentrated in the fisheries sectors" (WOC, 2016, p. 11). Portugal can set an important example, nationally and internationally, by adopting better practices.

The promotion of stakeholder engagement and public participation should be a priority within the Portuguese MSP process. Not only is Portugal's territory overwhelmingly marine, the success of the implementation of any efforts related to MSP will benefit greatly from a sense of ownership of these agents in relation to the process, and from a national sense of stewardship towards this maritime territory and its resources. Because civic engagement is a huge challenge in Portugal, with traditionally very low levels of participation in public processes (Schmidt *et al*., 2013; 2014), careful consideration should be given to the adoption of specifically designed methodologies to improve public participation and stakeholder involvement (*e.g.*, Pereira da Silva, 2002; 2006). Academia has a particular and irreplaceable role to play in contributing to this process (Ferreira *et al*., 2015, 2015b; Silva *et al*., 2013).

Engaging stakeholders and the wider public contributes also directly to transparency and, in this way, also improves adhesion to the implementation of MSP.

Context

Context will affect many aspects relevant for MSP design, implementation, and evaluation: the scale of zoning, the detail of management measures, knowledge and integration of baseline conditions (environmental, social, economic), but also the very capacity to implement monitoring and evaluation.

Picturing the planning of such a vast area as the Portuguese national maritime space, with the necessary timeframes of 50+ years to make such planning meaningful, almost seems to configure a situation of attempting to "plan the unplannable" (Alfasi & Portugali, 2004, p. 30). In the context of terrestrial planning, these authors oppose the traditional practice of trying to anticipate every possible situation, which they refer to as "planning just in case", to a more adaptive, and flexible approach of "planning just-in-time" (JIT). JIT should "use laws or rules referring to qualitative relations

between different activities and factors in the built environment (which) would apply to all individuals, firms, associations, and planners, as well as to dwellings, businesses, industry, public buildings and infrastructures." (*ibid.*, p. 32). They proposed that under a JIT planning system, there is no "future complete picture in the form of a long-term plan that it should accomplish" as the territory "is always under construction but it is never finished or completed" (*ibid.*, p. 32). A second aspect these authors highlight is that "since the same set of planning laws is valid everywhere, it is memorable and well known to the many agents that operate in the (territory)" (*ibid.*, p. 33). With the necessary adaptations to the marine environment and to MSP, this approach might offer advantages over more classical "ocean zoning".

In terms of monitoring and evaluation, the importance of context can be simply understood using two very different MSP situations to illustrate overwhelming differences: evaluating performance of Belgium's marine spatial planning (3,500 km^2 of the North Sea, cf. Table 3.2. above) is obviously not the same as carrying out a performance evaluation of Portuguese MSP (3,800,000 km^2 or 4% of the Atlantic ocean). Not only is the latter planning area more than 1,000 times larger than the former, baseline conditions, added to the sheer environmental complexity (large depths, varied geology, and habitat diversity), and to remoteness/inaccessibility, constitute comparatively huge data gathering and monitoring/evaluation challenges (Johnson & Ferreira, 2015). While those challenges are no excuse for avoiding this step, they must be taken into consideration when drawing up an implementable and meaningful monitoring and evaluation framework.

5.5. Chapter summary

The chapter started with the presentation and discussion of a framework for evaluating performance of Portuguese MSP followed by the proposal of a generalised simplified model for the evaluation of MSP performance.

A critical evaluation of the methodological approach ensued focusing on four key aspects of the adopted approach and exploring potential strengths and weaknesses: the choice of basing the analysis on legally stated objectives, a discussion

on indicators, the involvement of stakeholders in the process, and the focus on outreach and communication.

The last section of the chapter reflects on recent findings from the reality of MSP implementation, and on the results of the analyses of the Portuguese legal framework presented in chapter 2 to draw attention to aspects that deserve particular attention and further development in the next stage of MSP in Portugal: the development, implementation, and evaluation of the situation plan.

Conclusions

Before the fiddlers have fled
Before they ask us to pay the bill
And while we still have the chance
Let's face the music and dance

Irving Berlin (1936)

Conclusions

"I am the Lorax. I speak for the trees. I speak for the trees, for the trees have no tongues"

In Dr. Seuss' "The Lorax" (1971)

An original contribution to evaluate performance of Portuguese MSP

"A proper legal framework is a critical objective of MSP" (EC/DG-MARE, 2011, p. 14) and is acknowledged as a necessary first step of the MSP process (Ehler & Douvere, 2009). Portugal has assumed a leading role internationally by defining a legal framework for MSP for the entirety of its national maritime space, making up 97% of the Portuguese territory, and encompassing almost 50% of the marine waters of the EU. In creating this legal framework, it was also the first country to transpose into national law the EU MSP directive.

The stated overall goal of the Portuguese MSP framework is to contribute to the country's sustainable development. The ecosystem approach is the first principle adopted in the base law for MSP (Law 17, 2014), and the decree-law that develops it (Decree-Law 38, 2015) has various references to the preservation of good environmental status (under the MSFD) as a pre-condition for the development of any activities in the national maritime space.

However, this legal framework is more objectively concerned with "the promotion of economic exploitation", and contains aspects whose implementation may jeopardise the achievement of those high-level objectives and principles: a differential treatment is given to existing and prospective new uses, favouring the latter over (if not at the expense) of the former and even of the environment; legally established criteria for choosing between competing activities (jobs created, qualification of human resources, volume of investments) favouring new over existing activities; exempting the activities with potentially higher environmental impacts (such as sea-bed mining and offshore drilling) from the payment of a private use fee created, *i.a.*, to anticipate the environmental costs of activities liable to cause significant

environmental impact; the possibility of automatically revoking MPAs (representing international conservation commitments) on vague grounds of "national interest". In this framework, environmental concerns always appear subsidiary to economic growth, but implementation alone will tell how these aspects will be dealt with in practice (Ferreira *et al*., 2015a; Frazão Santos *et al*., 2014). Planning for the evaluation stage of MSP is critical from the outset and must be consistent with MSP principles, including a strong participation base. That was the core of this research.

The specific objectives outlined for this research were fully accomplished:

1. *Analysis of the current policy seascape for Portuguese MSP*: two separate analyses were carried out based on the experience of MSP practitioners in a different context (the U.S.) and on the expert judgement of Portuguese specialists in various fields related to MSP. These analyses highlighted various aspects that deserve further attention and improvement in the legal framework, and, therefore, merit particular care in the performance evaluation mechanism.
2. *Development of an indicator system to evaluate performance of Portuguese MSP through a participatory approach*: a step-by-step process was designed to select indicators relevant to legally stated objectives of Portuguese marine spatial plans. This process iteratively involved national and international experts in the field of MSP and evaluation, MSP practitioners, members of academia, public officials and other stakeholders, through a series of semi-structured interviews, a workshop, and a public debate. This resulted in a set of preferred indicators developed with the experts, which was scrutinized, commented on, and validated by the heads of the three agencies responsible for national MSP.
3. *Proposal of guidelines for an evaluation mechanism to assess performance of Portuguese MSP*: based on the results of the research carried out for the two first objectives, an evaluation mechanism for evaluating MSP performance was proposed grounded on the EU's MSP principles.

This thesis constituted a first approach to a mechanism to evaluate MSP performance for the entire Portuguese national maritime space, from the outset of the planning process. Indicators selected are related to the EU's eleven principles for MSP and the legally stated objectives of Portuguese MSP, and cover key aspects of MSP: the ecosystem-approach to management, data and knowledge base, transparency, stakeholder participation, improved coordination, legal certainty, and articulation at the boundaries of MSP (land-sea integration, and cross-border cooperation).

The strengths and weaknesses of this research approach have been highlighted throughout this study, were detailed in section 5.3, above, and are summarized in table C.1. below.

Table C.1. Strengths and weaknesses of this research.

Topics	**Pros/Strengths**	**Cons/Weaknesses**
Use of legally stated objectives of Portuguese MSP	- Their use maximised practical interest and relevance of the research	- Dubious/vague phrasing of objectives conditioned definition of indicators
Proposed indicators	- Grounded on provisions and measures included in framework - Redundancy in themes covered promote resilience of indicator set/evaluation	- High-level indicators may allow multiple interpretations - Some aspects of obj. b) (*e.g.*, effects of climate change) and obj. c) (safeguard of underwater cultural heritage) require further development
Participatory indicator development process	- Promoted discussion, communication, and clarification of MSP concepts among academics/practitioners - garnered broad support of process and indicators by agencies responsible for MSP evaluation	- Unbalanced sectoral representation
Communication strategy (timely information before/after stakeholder engagement)	- Substantiated and validated findings - Dissemination of topics of MSP and evaluation to a wider audience - Participants felt engaged and found research useful for their own work	- Time consuming

It is clear that the perceived strengths of this research approach far outweigh identified weaknesses, which do not question the value or validity of the approach, and can be addressed and overcome in the next stages of implementation.

Research results should be revisited in the ensuing stages of the Portuguese MSP process, at a minimum during the first moment of evaluation of the performance of Portuguese MSP established in the legal framework, to take advantage of emerging information that may contribute to improve it.

This research constituted a novel approach in Portugal, in terms of the number and diversity of MSP practitioners and stakeholders involved in the preparation of the evaluation stage of MSP. It materialised a shift from the current practice of top-down, unilateral, definition of evaluation mechanisms (including indicators) in MSP, towards a new, participatory, approach to the monitoring and evaluation stages of the MSP cycle – broadening the scope of "the public process" beyond the planning stage into the planning evaluation stage, to improve its chances of implementation and success (cf. MMO, 2016). For these reasons, while the proposed mechanism was focused on the Portuguese legal framework, it has the potential to be useful, relevant and adaptable to other coastal nations in Europe and beyond.

Recommendations to improve performance evaluation of Portuguese MSP

As a result of this research, from both the primary and secondary data sources, a number of key aspects emerged and are summarised here as recommendations for the next stages of MSP in Portugal:

- **Develop SMARTer objectives for Portuguese MSP:** As MSP progresses in Portugal, with the development of the marine spatial plan for the entire national maritime space, a better definition of objectives is key. While the Portuguese legal framework for MSP, including its stated objectives, is deeply rooted in the EU's blue growth development model, objectives which are truly strategic and adapted to the Portuguese case can now be beneficially developed in the framework of the situation plan, or of the Strategic Environmental Assessment of the Situation Plan (Ferreira *et al*., 2016c). The key aspect is making such objectives SMART (*Specific*, *Measurable*, *Achievable*, *Relevant*, and *Time-bound)* or, at least, SMARTer. This will constitute the clear foundation on which the definition of more refined indicators and of adequate

management measures for MSP depends for success. Concurrently, the clarification of the concept of sustainable development underlying the legal framework will contribute to improve performance evaluation.

- **Build, critically, on the indicator base provided here:** the indicator system/evaluation framework proposed here has been deemed by MSP agents and agencies as a suitable starting point for assessing performance of Portuguese MSP. However, a number of aspects require further development, ideally by the agents/agencies involved in MSP planning, monitoring and evaluation:
    - i) the establishment of the baselines for each indicator, to ascertain their status before any measures related to this MSP framework are implemented;
    - ii) critical interpretation of indicators, to unravel/pinpoint the causal link(s) related with the implementation of the MSP system, and therefore infer their significance in assessing the performance of the Portuguese MSP system;
- **Adaptively manage the indicator system/evaluation framework:** as the reality of implementation begins and progresses, with SMARTer objectives being articulated, and management measures defined and put in place, there will be a need to adaptively manage the indicator system proposed here. While some indicators may lose their importance, others may potentially emerge during MSP implementation as being more suitable or relevant.
- **Recognise context**: as highlighted in the discussion, the context of Portuguese MSP, starting with the sheer size of the NMS, will affect many relevant aspects: the working scale, type and development of management measures, knowledge and integration of baseline conditions (environmental, social, economic), but also the very capacity to implement monitoring and evaluation. As such, context must be constantly taken into consideration when drawing up an implementable and meaningful monitoring and evaluation framework for Portuguese MSP.

- **Effectively engage a wide range of stakeholders:** the **"**reality of implementation" shows that MSP is far from delivering its full potential, while it is not being able to prevent the continued degradation of the marine environment. To counter published accounts of mistrust among maritime sectors and users, of power games that favour new industrial uses over older traditional ones, a "more equity-based, democratic decision making, and a fairer distribution of our ocean wealth" through MSP is being called for (Flannery & Ellis, 2016, p. 121). This balancing of the power scale requires the effective engagement of a wide range of stakeholders, which represent the full diversity of maritime uses and activities. It is vitally important that Portugal sets an international example of best practices in this field too. To do so, it should broaden the range of avenues/possibilities to involve practitioners, stakeholders, and the wider public in the next steps of MSP, including the development of the situation plan and its associated Strategic Environmental Assessment. Experience shows that stakeholder engagement is critical to promote learning (by all the parties involved), and foster buy-in of proposals. Practitioners and stakeholders are more likely to adhere to MSP and be interested in forwarding it, if they have been involved in the planning process, including the definition of indicators and evaluation.
- **Develop a communication strategy to keep the public aware, informed and interested in the MSP process:** This aspect is closely related to the previous recommendation and crucial to ensure its success. Civic engagement is a considerable challenge in Portugal, requiring the development and adoption of specifically designed methodologies to improve public participation and stakeholder involvement (*e.g.*, Pereira da Silva, 2002, 2006). The social sciences have a particular and irreplaceable role to play in contributing to, and forwarding, these processes (Ferreira *et al*., 2015, 2015b; Silva *et al*., 2013) and should assume that role (cf. next section).

These recommendations are in line with the EC's Joint Communication on "International ocean governance: an agenda for the future of our oceans" (EC, 2016).

Back to Earth – the unique and irreplaceable role of the social sciences in MSP

As stated in the preceding section, the social sciences have a unique role to play in contributing to the MSP process as a way to promote sustainable development.

For Soromenho Marques (2011), "the paramount ontological question of our time" is "ascertaining whether our civilisation will be able to evolve in a positive way, facing the deadly challenges of the global environmental crisis, or if, on the contrary, we will remain hesitant, locked in our inertias and conflicts, incapable of constructing operational consensuses, allowing ourselves to slip into the abyss of collapse" (p. 12). This Portuguese academic and philosopher called on the scientific community, particularly the social sciences, to play a more decisive and proactive role in this current civilization shift. He drew from Bob Doppelt's statement in *the Guardian:* "One of the problems is that the issue is still being framed as a scientific and environmental issue. This is a major mistake. [It] is just a symptom of dysfunctional social and economic practices and policies. It is a social and economic issue. The emphasis needs to shift away from the biophysical sciences now to the social sciences if we have any hope of solving this problem." (Adam, 2009). In the same paper, Soromenho Marques advocated a new epistemic and philosophical revolution for science, a "return" from Copernicus to Ptolemeus, naturally not in substance but in shape, to a form of revisited "geocentrism". This "neo-Ptolemaic" science would, in the words of Hannah Arendt, "be geocentric in the sense that the Earth, and not the universe, is the center and the home of mortal men, and it would be anthropomorphic in the sense that man would count his own factual mortality among the elementary conditions under which his scientific efforts are possible at all" (Arendt, 1963).

Along a different path of reasoning, Scruton (2012) referred to "oikophilia, the love of the *oikos*, or household", as a motive (or family of motives) to prompt action on environmental issues. He explained that as "sentiments of territorial attachment (…) the shared love of a shared place, (…) the shared love for our home (…) have helped to maintain an inherited equilibrium that is both social and ecological" (p. 23, 25). He argued: "We should recognize that environmental protection is a lost cause if we cannot find the incentives that would lead people in general, and not merely their self-

appointed representatives, to advance it. Here is where environmentalists and conservatives can and should make common cause. That common cause is *territory* – the object of a love that has found its strongest political expression through the nation state"[42] (p.19, emphasis added).

In Scruton's endeavour to find incentives to lead "people in general" to advance environmental protection, he was referring to the importance of eliciting participation. In policy and planning, the emphasis is typically on stakeholder involvement, referring to those, within the wider universe of the general public, who hold a specific stake or have a direct interest in the outcome of the process at hand. In the context of the development, implementation, and evaluation of MSP initiatives, existing users are often not aware of the fact that they are stakeholders, and are therefore ignorant of their role in the process: this includes consumptive uses, such as fisheries, but also non-consumptive uses, such as tourism and leisure (consider the enjoyment provided by the scenic beauty of a pristine seascape). All these activities provide financial and/or spiritual sustenance for a wide range of individuals and communities who are, in fact, stakeholders, although often they don't realize that until their stake is lost (*e.g.*, by an obstructed sea view, or by other degraded environmental conditions) (Ferreira, 2016c). In fact it may be argued that when public issues are at stake, such as the management of ocean space and resources, all citizens are stakeholders.

One defining aspect of participation mentioned by various MSP practitioners in the U.S. during the round of interviews conducted there during this research, was that of citizen responsibility: "In a democracy, the people's voice should be heard, and if people don't do that, if they just shrug their shoulders and say 'I don't have time' or 'I don't want to bother with it', that's how ultimately dictatorships come into play" and "If something's not going properly, you gotta raise your politicians' awareness." The powerful, yet often neglected, message contained in these statements is that every citizen in a democracy has a responsibility to contribute to its betterment. This can

[42] And on nationality: "there is a very good reason for emphasizing nationality. For nations are communities with a political shape. (…) Were conservatism to adopt a slogan, it should be "feel locally, think nationally" (Scruton, 2012, p. 20).

either be done in the framework of each one's professional roles (as a public official, industry promoter, academic, …), and/or as a representative of organized civil society (NGO representative), or as an individual. Every citizen has a role to play. The consequence of one not assuming one's role, was summarized by Ehler (2016) in the context of MSP initiatives as "you're either at the table, or you're on the table", and he added "there are some good examples where stakeholders immediately become losers in the process simply by not being involved" (para. 6). In other words, one must assume responsibility for one's action or lack thereof.

From the reasoning above, it becomes clear that the social sciences have a key role to play in the treading of this urgent path toward sustainability, of which ocean governance, and MSP, are paramount branches. A focus on space – as a territory – and on people – and their sense of place – are the unquestionable domains of geography, and related disciplines. As researchers in the social sciences, as MSP practitioners, as educators, as citizens, we have a unique role and responsibility to actively and collectively contribute to advance society: in this particular context of (Portuguese) MSP, by promoting information dissemination, by increasing awareness of and literacy on maritime issues, by informing and getting involved in political and planning processes, and by any other creative process one can devise. Such initiatives should namely contribute to bringing the legitimate interests of a wider array of stakeholders to the ocean planning processes and help balance the scales between promoting new uses and protecting existing ones – while preserving the fragile ecosystem upon which our well-being depends.

A Gold Rush on the Portuguese maritime space or Pandora's box?

Portugal is currently faced with a tremendous challenge: planning, managing, and enforcement of a huge maritime area to promote sustainable marine use and protection. However, the legal focus on exploitation raises concerns that the ocean is being perceived as a last frontier to be exploited, with a potential consequence being the (irreversible) environmental damage that such exploitation may bring about.

Norse (2007) eloquently discussed and theorized about the concept of frontier as applied to the ocean[43], and proposed that "one reason that countless indicators of marine 'health' are declining is the still-widespread belief that the sea is an inexhaustible cornucopia" (Norse, 2007, p. 423). This view is still promoted by many marine industries[44] and was reflected in the words of the then Portuguese minister of the sea, who, at a 2013 conference, referred to the "Portuguese sea" as a "treasure chest" (Frazão Santos *et al*., 2015) Such a notion of the potential unlocking of vast resources in Portugal's ocean waters and underlying seabed, in the wider context of the worldwide economic crisis, so severely felt in Portugal, may bring about a gold rush on the Portuguese maritime space. However, unbridled access to the ocean commons treasure chest could result in a disastrous outcome more akin to opening Pandora's Box than to a universal boon (Ferreira *et al*., 2015a).

As recommended by this research, a clear definition of objectives, an adequate consideration and protection of existing ocean and coastal uses, and a comprehensive strategic evaluation of development alternatives in the framework of the SEA of the situation plan, must be grounded on informed and active stakeholder participation. These are crucial to achieve a more *equitable*, *democratic* and *fairer distribution of our ocean wealth* through MSP and to prevent conflicts in the Portuguese maritime space, contributing to its sustainable planning and use. Given its unique geostrategic position and size, the Portuguese approach to this and other challenges (land-sea interaction, EIA for novel activities, transparency, participation, etc.) in its MSP legal framework "might even make history" (Campbell, 2009, p. 33). Implementation will tell whether it becomes an example to follow or an approach to avoid.

[43] However, as Shakeroff *et al*. (2009) pointed out, the Ocean is no longer the last frontier, as it is already "colonized" – a "peopled seascape".

[44] As an example, at a Sea Forum in Porto (Portugal), one promoter of sea bed mining concluded his presentation stating that "the next "pot of gold" at the end of the rainbow may be on the sea floor". (Scott, 2006). This may be seen as a direct allusion to the Rainbow Hydrothermal vent field, nominated by Portugal as an MPA in 2006.

"'But *now*,' says the Once-ler,
'Now that *you're* here,
The word of the Lorax seems perfectly clear.
UNLESS someone like you
Cares a whole awful lot,
Nothing is going to get better.
It's not."

Dr. Seuss, The Lorax (1971)

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Annexes

Annex I. U.S. MSP experience: Interview list

#	Name	State	Role
1	Brad Pettinger	Oregon	ORTrawl (fishing)
2	Paul Klarin	Oregon	Department of Land Conservation and Development (DLCD)
3	Andy Lanier		
4	Mark Cedergreen	Washington	Charter fisherman
5	Gus Gates	Oregon	Surfrider Foundation
6	Terry Thompson	Oregon	Lincoln County Commissioner
7	Mary Abrams	Oregon	Department of State Lands (DSL)
8	Chris Castelli		
9	David Allen	Oregon	OPAC
10	Carrie Pomeroy	California	University of Santa Cruz
11	Dave Beutel	Rhode Island	Coastal Resources Management Council
12	Jen McCann	Rhode Island	URI, Sea Grant
13	Madeleine Hall-Arber	Massachusetts	MIT Sea Grant College Program
14	Caren Braby	Oregon	Oregon Department of Fish and Wildlife (ODFW)
15	Dave Fox		
16	Jennifer Hennessey	Washington	Department of Ecology
17	Scott McMullen	Oregon	OPAC
18	Stephanie Moura	Massachusetts	SeaPlan
19	Kaety Hildenbrand	Oregon	OSU
20	Dale Beasley	Washington	Coalition of Coastal Fisheries
21	Onno Husing	Oregon	Lincoln County Dept. of Planning & Development

Annex II. Example of indicator factsheet: Condition of Marine Protected Areas

NAME	**Condition of Marine Protected Areas**
Unit	
Reference	Shetland Island's Marine Spatial Plan
Link to objective	b)
Sub-objective (optional)	Preservation
Relevance	Related to UN SDG Goal14
Target	
Target text and reference	UN SDG Goal14: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans
Monitoring program	Related to Portuguese Monitoring MSFD **MONIAMT – Monitoring maritime tourism activities in coastal and oceanic areas of the Azores** Indicators: Effort and activity pattern Places and times of activity Target species **FISH&SHIPS – Monitoring fishing activities and maritime traffic in offshore MPAs (3 EEZ and Cont. Shelf beyond 200 NM)** Indicators Boat density Density of maritime traffic **MONIZEC (AMP) – Monitoring environmental condition of MPAs** 1.1.1 – Distribution area; 1.1.2 – Distribution model within the area; 1.1.3 – Spp. areal coverage (for sessile and benthic species); 1.2.1 – Population abundance and/or biomass; 1.3.1 – Demographic characteristics of the population (*e.g.*, size or age structure, sex ratio, fertility rates, survival/mortality rates); 1.3.2 – Genetic structure of the population; 1.5.1 – Habitat area; 1.5.2 – Habitat volume, if relevant; 1.6.1 – Condition of species and typical communities; 1.6.2 – Relative abundance and/or biomass; 1.6.3 – Physical, hydrological and chemical conditions; 1.7.1 – Composition and relative proportions of ecosystem components (habitats and species).
Monitoring frequency	
Data source/Data provider	
Entity responsible	
Comments	**Including Natura 2000 sites**

Annex III. Indicator questionnaire used in step 3

INDICATORS TO EVALUATE PERFORMANCE OF PORTUGUESE MARINE SPATIAL PLANS

Objective: To create a mechanism to evaluate the performance of future Portuguese MSP instruments, by relating their objectives with indicators.

In Portugal, the objectives of future MSP instruments were stated in Decree Law 38/2015, of 12 March:

a) *To implement the objectives of strategic development established in the strategic instruments of the spatial planning and management of the national maritime space, namely in the National Ocean Strategy;*
b) *To promote the sustainable economic, rational and efficient exploitation of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change;*
c) *To align (order) the uses and activities to be developed in the national maritime space taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment;*
d) *To prevent or minimize eventual conflicts among uses and activities developed in the national maritime space;*
e) *To ensure legal certainty and transparency of the procedures entrusting the rights of private use in the national maritime space;*
f) *To ensure the use of available information on the national maritime space.*

Based on these objectives, a set of potential indicators was selected, drawing from bibliography related to Marine Spatial Planning (cf. attached references), and from expert interviews.

In the following pages you will find a list of indicator for each of the objectives stated above (except objective a), for its strategic character and direct link with the National Ocean Strategy).

As an expert in this field we ask you to please:

RANK the INDICATORS according to RELEVANCE and FEASIBILITY (explained below):

SHARE any comments/suggestions that you deem relevant (including new or alternative indicators), either in the "Notes" column of each table or in the comments field below each table.

THANK YOU FOR CONTRIBUTING TO THIS STUDY WITH YOUR TIME AND EXPERTISE.

CRITERIA TO CLASSIFY INDICATORS

RELEVANCE: (*1: not very relevant; 2: somewhat relevant; 3: very relevant*; NA: *no answer*)

Includes: Link with policy objectives; Technical and scientific importance; Synthesis capability; Usefulness for communicating and reporting to a wide audience

FEASIBILITY: (*1: Low; 2: Medium; 3: High;* NA: *no answer*)

Includes: Robustness; Cost; Operationalization

Objective b) *To promote the sustainable economic, rational and efficient exploitation of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change;*

INDICATOR	UNIT	RELEVANCE	FEASIBILITY	NOTES
- Requests to use the national maritime space	No.			
- Changes in the use of maritime space	%			
- Private investment in the national maritime space	€			
- Public and private investment in RDT by sector of maritime activity	€			
- Contribution of maritime economic activities in the trade balance	€			
- GAV by sector of maritime economic activity	€			
- GDP/*capita* of coastal residents	€/inh.			
- Electricity generated from marine renewables	%, GWh			
- Explore new market niches and product diversification	No./%			
- Trends in benefits that humans derive from ecosystem services: GAV in the Environmental Goods and services sector	% GDP			
- Trends in benefits that humans derive from ecosystem services: employment in the Environmental Goods and services sector	% total employment			
- Fisheries with sustainable certification (Certified fisheries)	%			
- Quality certification schemes (aquaculture)	%			
- Green award certification (shipping)	No., %			
- Stocks at MSY (*Maximum Sustainable Yield*)	%			
- Stocks overfished	%			
- Unwanted catches& discards /catches landed	%			
- Tourism figures for wildlife visitor attractions	No.			
- Benefit sharing with coastal communities	-			
- Shipping density	-			
- Coastal & marine area protected	%			
- Degraded ecosystems restored	%			
- Developments permitted impacting designated sites/species	No.			
- Condition of Marine Protected Areas	-			
- Conservation status of marine mammals	-			
- Conservation status of marine birds	-			
- Environmental Status of the marine environment	MSFD			
- State of coastal and transition waters	WFD			
- Trends of invasive alien species	No.			
- Escapement of cultured species	No.			
- Marine trophic index	-			
- Red List Index	-			
- Status of target species	-			
- Food chain impacts				
- Greenhouse Gas emissions from maritime transport	g/tonkm			
- Energy efficiency	?			
- Specific CO_2 emissions	g/tonkm			
- Plastic materials entering ocean	ton/y			
- Pollution incidents reported	No.			
- Incidents of dumping at sea	No.			
- Applications with waste/litter management plan/measures	No.			
- Operational pollution from ships	No.			
- Port waste reception facilities available	%			
- Noise	-			
- People & goods affected by storms	%, No.			
- Losses from climate related events	€			

Comments: _____

Objective c) *To align (order) the uses and activities to be developed in the national maritime space taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment*

INDICATOR	UNIT	RELEVANCE	FEASIBILITY	NOTES
- Marine areas and coastline with formulated &adopted ICM/MSP plans	%			
- Zoning plans and regulations completed, approved & implemented	%			
- Applications where there are potential impacts on a site designated for historical environment	No.			
- Condition of sites designated for historical environment	-			
- Monitoring & mapping of new historical environment sites discovered as part of a development	%			
- Employment rate of population aged 20-64	%			
- Employment rate in maritime sectors	%			

Comments: _____

Objective d) *To prevent or minimize eventual conflicts among uses and activities developed in the national maritime space*

INDICATOR	UNIT	RELEVANCE	FEASIBILITY	NOTES
- Conflicts in the use of maritime space by type and frequency	No.			
- Reported navigational accidents as a result of a marine development (construction or operation)	No.			
- Applications refused due to incompatibility with other marine uses	No.			
- Applications where there are potential impacts on the marine environment as a result of infrastructure development	No.			

Comments: _____

Objective e) *To ensure legal certainty and transparency of the procedures entrusting the rights of private use in the national maritime space*

INDICATOR	UNIT	RELEVANCE	FEASIBILITY	NOTES
- Licenses refused	No.			
- Conflicting processes at one-stop-shop	No.			
- Access to data (allowing for peer-reviewing of scientific advice)	% requests			
- Access to meeting documents	% requests			
- Rules concerning the participation of civil society observers				
- Access to compliance and performance measures				

Comments: _____

Objective f) *To ensure the use of available information on the national maritime space*

INDICATOR	UNIT	RELEVANCE	FEASIBILITY	NOTES
- Existence of a system of annual update	-			
- Incorporation of knowledge into management plans	-			

Comments: _____

Annex IV. Indicator development process: Interview list

#	Name	Affiliation*
1	Margarida Almodovar	APA
2	Gonçalo Carneiro	NIRAS International Consulting (Sweden)
3	Emanuel Gonçalves	ISPA
4	Stephanie Moura and Andy Lipsky	SeaPlan-Massachusetts Ocean Plan (U.S.)
5	Francisco Andrade	FCUL
6	Barbara Neumann	Institute of Geography (Germany)
7	Charles Ehler	Ocean Visions Consulting (France)
8	Juan Luis Vivero	Univ. Sevilla
9	Helena Calado	Univ. Açores
10	António Domingos Abreu	CNADS/UNESCO/EEAC/Madeira
11	Margarida Pereira	FCSH-UNL
12	Constança Belchior	European Environment Agency (EU)
13	Vasco Becker-Weinberg	FDUNL
14	Jen McCann	CRC – Univ. Rhode Island (U.S.)
15	Cristina Ramos	INE – Conta Satélite do Mar
16	Marta Chantal	Univ. Porto
17	Conceição Santos	DGPM
18	Tundi Agardi	Sound Seas (U.S.)
19	José Guerreiro	FCUL-MARE
20	Catarina Grilo	Gulbenkian Oceanos
21	Marie Bonnin	IRD (France)
22	Sofia Rodrigues	APA
23	Fátima Alves	Univ. Aveiro
24	André Couto	DGRM
25	Paul Gilliland	Marine Management Organisation (UK)

* Institutions are shown here for reference. Interviewees participated on their individual capacities.

Annex V. Participative workshop: List of participants

Name	Affiliation*
André Couto	Direcção-Geral de Recursos Naturais, Segurança e Serviços Marítimos (DGRM)
Catarina Frazão Santos	Faculdade de Ciências da Universidade de Lisboa (FCUL)
Constança Belchior	European Environment Agency (EEA)
Cristina Ramos	Instituto Nacional de Estatística INE)
Francisco Andrade	Faculdade de Ciências da Universidade de Lisboa (FCUL)
Gonçalo Carvalho	PONG Pesca
Helena Calado	Universidade dos Açores (UAc)
Isabel Torres de Noronha	Future Ocean Alliance (FOA)
Lisa Sousa	Universidade de Aveiro (UA)
Margarida Almodovar	Agência Portuguesa do Ambiente (APA)
Maria da Luz Fernandes	Universidade de Aveiro (UA)
Maria Ferreira	Coastal & Marine Union (EUCC)
Mário Silva	Instituto da Conservação da Natureza e das Florestas (ICNF)
Marisa Batista	Liga para a Protecção da Natureza (LPN)-PONG Pesca
Rui Velasco	Instituto de Ciências Sociais da Universidade de Lisboa (ICS-UL)
Vasco Becker-Weinberg	Faculdade de Direito da Universidade Nova de Lisboa (FDUNL)
Yorgos Stratoudakis	Instituto Português do Mar e da Atmosfera (IPMA)

* Institutions are shown here for reference. Participants were invited on their individual capacities.

Annex VI. Publications produced during the research

Peer-reviewed papers in international journals (attached)

Ferreira, M.A., Johnson, D., Pereira da Silva, C., 2014. How can Portugal effectively integrate ICM and MSP? *Journal of Coastal Research*, *SI 70,* 496-501

Ferreira, M.A., Pereira da Silva, C., Campbell, H.V., Conway, F., Andrade, F., Johnson, D., 2015. Gold Rush or Pandora's Box? Toward a transparent and measured approach to MSP in Portugal. *The International Journal of Marine and Coastal Law*, *30(3)*, 418-444 .

Ferreira, M.A., Calado, H., Pereira da Silva, C., Abreu, A.D., Andrade, F., Fonseca, C., Gonçalves, E.J., Guerreiro, J., Noronha, F., Pereira, M., Pinto Lopes, C., Ribeiro, M.C., Stratoudakis, Y., Vasconcelos, L., 2015b. Contributions towards maritime spatial planning (MSP) in Portugal – Conference report. *Marine Policy*, *59*, 61-63.

Ferreira, M.A., Johnson, D., Pereira da Silva, C., 2016. Measuring success of Ocean governance: a set of indicators from Portugal. *Journal of Coastal Research*, *SI 75*, 982-986.

Ferreira, M.A., Johnson, D., Pereira da Silva, C., Ramos, T. (accepted). Performance evaluation for Portuguese Marine Spatial Planning. Journal of Cleaner Production.

Peer-reviewed papers in conference proceedings (attached)

Ferreira, M. A., Pereira da Silva, C., Johnson, D., & Andrade, F. (2015d). O Mar Português como uma Arca dos Tesouros?. In M. J. Roxo, R. P. Julião, M. Pereira, & D. Gil (Eds.), Actas X Congresso da Geografia Portuguesa – Os valores da Geografia (pp. 694-699). Associação Portuguesa de Geógrafos.

Ferreira, M.A., Johnson, D., Pereira da Silva, C., Ramos, T., 2016b. Performance evaluation for Portuguese Marine Spatial plans. In: Joanaz de Melo, J., Disterheft, A., Caeiro, S., Santos, R.F., Ramos, T. (Eds.), *Proceedings of the 22nd International Sustainable Development Research Society Conference (ISDRS 2016) – Rethinking*

Sustainability Models and Practices: Challenges for the New and Old World Contexts. FCT/UNL, CENSE, ISDR Society. Volume 1: 90-103.

Ferreira, M.A., Andrade, F., Johnson, D., Pereira da Silva, C., 2016c. How strategic is the Strategic Environmental Assessment of future Portuguese marine spatial plans in the European context? In: Joanaz de Melo, J., Disterheft, A., Caeiro, S., Santos, R.F., Ramos, T. (Eds.), *Proceedings of the 22nd International Sustainable Development Research Society Conference (ISDRS 2016) – Rethinking Sustainability Models and Practices: Challenges for the New and Old World Contexts.* FCT/UNL, CENSE, ISDR Society. Volume 1: 78-85.

Ferreira, M. A., Andrade, F., Johnson, D., & Pereira da Silva, C. (2016d). Crescimento ou Desenvolvimento Azul no "Mar Português"? In N. Martins, J. Joanaz de Melo, A. Disterheft, S. Caeiro, M. Montaño, E. Moretto, T. B. Ramos (Eds.), *Livro de actas do 1º Simpósio Luso-Brasileiro sobre Modelos e Práticas de Sustentabilidade*, volume 2 (pp. 692-699). FCT/UNL, IEE/USP. CENSE/FCUL.

Technical reports and communications (available online)

Ferreira, M.A., Calado, H., Pereira da Silva, C. 2015c. *Relatório final do Debate MAR Português: Contributo para o Ordenamento Espacial.* CICS.NOVA/FCSH-UNL e CIBIO/UAç. FCSH-UNL, Lisboa, Janeiro de 2015. 25 pp. Online at: https://www.researchgate.net/publication/272784863_Relatorio_final_do_Debate_MAR_Portugues_Contributo_para_o_Ordenamento_Espacial

Ferreira, M.A., 2016. *Indicadores para avaliação do desempenho do sistema de ordenamento do espaço marítimo nacional: Relatório do Workshop participativo de 23 de Março de 2016*. CICS.NOVA/FCSH-UNL e CENSE/FCT-UNL. Lisboa, Maio de 2016. 20 pp + Anexos. DOI: 10.13140/RG.2.1.2606.8087. Online at: https://www.researchgate.net/publication/303718593_Indicadores_para_avaliacao_do_desempenho_do_sistema_de_ordenamento_do_espaco_maritimo_nacional_Relatorio_do_Workshop_participativo_de_23_de_Marco_de_2016?ev=prf_pub

Ferreira, M.A., 2016b. *Indicators to evaluate performance of the Portuguese MSP system: Final report of the Participatory Workshop of March 23, 2016* (abridged version of the full report in Portuguese). CICS.NOVA/FCSH-UNL and CENSE/FCT-UNL. Lisbon, June 2016. 19 pp + Annexes. Online at: https://www.researchgate.net/publication/304013067_Participatory_Workshop_Indicators_to_evaluate_performance_of_the_Portuguese_MSP_system

Ferreira, M.A., 2016c. Existing users often lack awareness of their role as stakeholders and their power to protect the ocean. In: New uses versus traditional uses in MSP: Who wins? Marine Ecosystems and Management (MEAM) newsletter, April 2016 (9:6). Online at https://meam.openchannels.org/news/meam/new-uses-versus-traditional-uses-msp-who-wins

Ferreira, M.A., Johnson, D., Pereira da Silva, C., 2014. How can Portugal effectively integrate ICM and MSP? *Journal of Coastal Research*, SI 70: 496-501

How can Portugal effectively integrate ICM and MSP?

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ABSTRACT

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In 2013, the European Commission proposed a Directive to spur the integration of Maritime Spatial Planning (MSP) and Integrated Coastal Management (ICM) within and across Member States. To ascertain if key elements for integration exist, fundamental questions should be addressed: Are there (compatible) national policies/plans for the coast and ocean? Are ICM strategies in line with MSP policies? Are the agencies responsible for ICM and MSP coordinated? Are there common goals, indicators and integrated measures between both types of policies/plans?
Portugal is one of the world's largest maritime nations, and is actively engaged in preparing policies and planning/management legislation for the ocean. An analysis of the current Portuguese policy/legislative framework, in terms of the above mentioned questions, suggested that: coordination among coastal and maritime policies and strategies is unclear, as is the articulation between institutions and between spatial plans for coastal and maritime zones; objectives of relevant policies are mismatched; there are yet no indicators to evaluate coastal and ocean policies/plans, and the articulation between measures to integrate ICM and MSP is unclear. Despite language barriers and people/institutional resistance to change, effective integration of MSP/ICM requires: flexibility and novel approaches, public participation and stakeholder involvement, systemic approaches, and finding strategic level indicators to evaluate integrated policies. Portugal can play a lead role in setting an example for other coastal nations worldwide. If appropriately tackled, the mismatches highlighted in this analysis provide pointers that may contribute to a more effective integration of ICM and MSP in Portugal and in other coastal nations.

ADDITIONAL INDEX WORDS: *marine spatial planning, ICZM, ICOM, plan evaluation, indicators*

INTRODUCTION

The coastal zone (including estuaries) is the gateway (entry and exit point) of all maritime activities: shipping, fisheries and aquaculture, marine (renewable) energies, mineral's/ore extraction, cables and pipelines, etc. All require dedicated space for the installation of related infrastructure. As such, integrated coastal planning and management must take into account maritime activities and, therefore, be integrated with Maritime Spatial Planning (MSP). Perhaps one of the most consensual definitions of MSP is "a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specificed through a political process." (Ehler and Douvere, 2009, p.18). The recent proposal (March 2013) of a new European Directive establishing a framework for MSP and Integrated Coastal Management (ICM) (European Commission, 2013), is recognition of the need to achieve coherence between ICM and MSP within and across national borders. It is evident that despite the obvious importance of a concerted approach and of various calls for action, European Member States have yet to comprehensively apply the principles and practice of ICM or effectively link ICM with MSP. Worldwide, other coastal nations are faced with this same challenge. Why has it been so difficult to coherently combine coastal and maritime policy, planning and management and how can this integration be achieved?
Various questions can be asked to try to approach this issue:

- Are there national policies and plans in place for both the coastal zone and the ocean?
- Are ICM strategies in line with MSP policies?
- Are planning instruments for coast and ocean compatible?
- Is there coordination between the agencies responsible for ICM and MSP?
- Are there common goals/overarching objectives between the two types of policies?
- Are there common indicators? In what areas/fields?
- Is there scope for integrated measures?

Portugal is one of the world's largest maritime nations: the Portuguese EEZ (mainland+Madeira+Azores) totals 1,700,000 km^2 (MAOT, 2011). It is also the 2nd biggest EEZ in the territory of the European Union (Sea Around Us Project, 2013). About ¾ of the Portuguese population lives on the coast, which contributes to 85% of the national GDP (APA, 2012). As such, the Portuguese case can be used to illustrate some of the challenges facing the effective integration of ICM with MSP.

Portuguese national policies and plans specifically addressing ICM and MSP were reviewed and compared to try to answer the

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Table 1. Portugal's main policy and planning framework for ICM and MSP. HWST: High water spring tide; nm: nautical miles.

	ICM	MSP
National Policy	*2009 – National Strategy for Integrated Coastal Zone Management (ENGIZC)*	*2013 – National Ocean Strategy (ENM) (revision of 2006 version)*
Geographic range	Landward: 2 km inland from max. equinoctial HWST Seaward: territorial waters (12 nm) incl. the seabed.	Coastal to 200 nm/Outer Continental Shelf
Planning	*1993/2012 – Shoreline Spatial Plans (Planos de Ordenamento da Orla Costeira)*	*2013 – Draft Framework Law for Maritime Spatial Planning and Management*
Geographic range	Coastal & interior maritime waters (excl. ports), their seabed & margins from the 30 m isobath to a line 500-1000 m inland from the sea margin (50m inland from max HW)	From the baseline (the low water line along the coast) to the outer limit of the continental shelf beyond 200 nautical miles.

questions highlighted above and to contribute to an assessment of how ICM and MSP connect in the current Portuguese framework.

Some of the legislation is still under discussion (reflecting in other words the fact that this is a relatively new policy and planning field).We present results of an in-depth analysis of the Portuguese situation with integrating ICM and MSP and discuss challenges facing all EU coastal Member States, having noted similar challenges and efforts in other parts of the world.

THE PORTUGUESE SITUATION

Policy and planning framework for ICM and MSP

The main policy and planning framework for ICM and MSP in Portugal is summarized in Table 1 and their territorial expression is depicted in Figure 1.

The national policy for integrated coastal management in Portugal is the National Strategy for Integrated Coastal Zone Management (ENGIZC) adopted in 2009. Its stated vision is to achieve, by 2029, "A coastal zone which is harmoniously developed and sustainable based on a systemic approach and on the valorization of its resources and identity values, sustained on scientific knowledge and managed according to a model which articulates institutions, coordinates policies and instruments, and ensures the participation of the different stakeholders involved." (Resolution 82, 2009, p. 6067). Valorization is a term very frequently used in Portuguese policies and planning legislation. According to the Merriam-Webster dictionary it means "to enhance or try to enhance the price, value, or status (of something) by organized and usually governmental action" (Merriam-Webster, 2013).

The ENGIZC lists 4 thematic objectives and 4 transversal objectives (cf. Table 2): thematic objectives cover all the "sectors" traditionally considered as the pillars of sustainable development (environmental, social and economic objectives, together with objectives which are technical (prevent/manage risk situations)) (Defra, 2006) and relates to the promotion of the knowledge base required for action; transversal objectives are geared towards bettering the governance structure required for implementing the

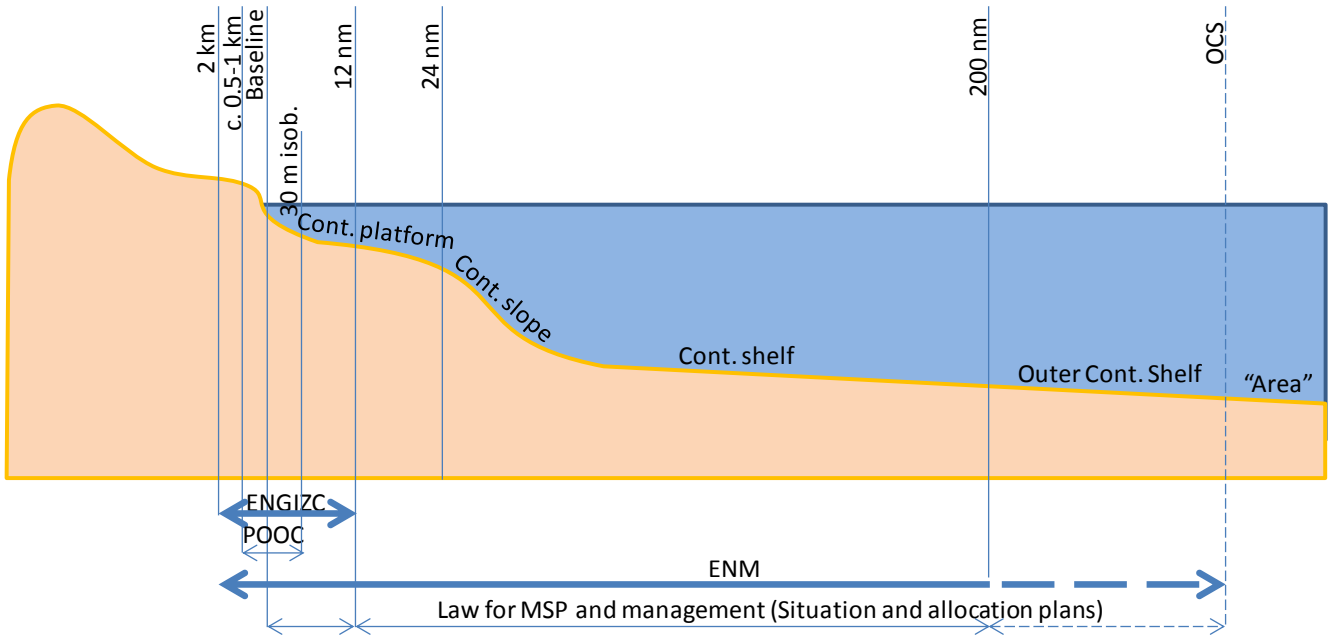

Figure 1. Schematic representation of the features and limits of the Portuguese coastal zone and maritime area, including the boundaries of relevant policies and plans. nm: nautical miles. ENGIZC: National Strategy for Integrated Coastal Zone management. POOC: Shoreline Spatial plans; ENM: National Ocean Strategy. OCS: Outer Continental shelf.

Table 2. Objectives of Portuguese policies and planning instruments for ICM and MSP. En: Environmental; Soc: social; Ec: Economic; Kn: Knowledge; G: Governance; F; Framework; T: Technical.

	ICM	MSP
Objectives	**ENGIZC (2009)** *Thematic objectives* a) Conserve and valorize resources and the natural, landscape and cultural heritage (En) b) Anticipate, prevent and manage risk situations and environmental, social and economic impacts (T) c) Promote the sustainable development of activities which generate wealth and contribute to the valorization of specific resources of the coastal zone. (Soc, Ec) d) Deepen the scientific knowledge on coastal systems, ecosystems and landscapes. (Kn) *Transversal objectives* a) Develop international cooperation (G) b) Strengthen and promote institutional articulation and the coordination of policies and instruments (G) c) Develop observation and monitoring mechanisms and networks (Kn); d) Promote public information and participation (G).	**ENM (2013)** • Reaffirm the national maritime identity in a modern, pro-active and entrepreneurial framework. (F, Ec) • Achieve the economic, geostrategic and geopolitical potential of the national maritime territory, turning the Portuguese Sea into an active (asset) with permanent economic, social and environmental benefits. (F, Ec, En) • Create conditions to attract national and international investment in all sectors of the sea economy, promoting growth, employment, social cohesion and territorial integrity, and increasing by 2020, the direct contribution of the sea sector to the national GDP by 50% (Ec). • Strengthen the national scientific and technological capacity, stimulating the development of new areas of action which promote knowledge of the Ocean and enhance, in an effective, efficient and sustainable way, its resources, uses, activities, and ecosystem services (Kn, Soc, Ec, En). • Consecrate Portugal, at the global level, as a maritime nation and as an inescapable part of the IMP and of EU's maritime strategy, namely for the Atlantic area (F).
Planning legislation objectives	***Shoreline Spatial Planning Law (Planos de Ordenamento da Orla Costeira) (1993/2012)*** a) Establish regimes to safeguard resources and natural values, and sustainable coastal zone management (En); b) Foster the sustainable development of the coastal zone (En, Ec) c) Make different coastal zone uses compatible (Ec) d) Promote the requalification of water resources (En) e) Value and qualify strategic beaches (En, Ec) f) Classify and discipline bathing beaches's use (En, Ec) g) Protect and valorize marine and terrestrial ecosystems (En) h) Identify and establish safeguard mechanisms of areas at risk (G) i) Ensure the articulation among territorial management instruments applicable in the area of the POOC (G)	***Framework Law for Maritime Spatial Planning and Management (Draft Law 113/XII, 2013)*** "promotion of the economic, rational and efficient exploitation of marine resources and ecosystem services, ensuring the compatibility and sustainability of the diverse uses and of the activities developed within it, considering the intergenerational responsibility in the spatial use of the national maritime space and aiming at job creation. (Ec)
Planning instruments	POOCs – shoreline spatial plans	Situation plans and Allocation plans (yet to be implemented)

strategy. The ENGIZC determined that a set of indicators to evaluate its efficiency and efficacy should be defined within 6 months of its entry into force. According to Alves *et al*. (2013), a national monitoring program (M18, Table 3) was initiated. It isn't clear if an evaluation of efficiency/efficacy has been performed.

The main planning instruments for the coast are the Shoreline Spatial Plans (*Planos de Ordenamento da Orla Costeira*, POOC), created in 1993. POOC implementation started in 1998 and presently the entire coast of the mainland, except ports/harbors, is covered by one of these plans (for a recent discussion of POOC implementation, see Ferreira *et al*., 2013). The POOCs did not propose indicators for their evaluation. Their legal regime, including their territorial scope and objectives, was revised in 2012 (cf. Table 2). POOCs have a great stated focus on environmental objectives (Table 2) and cover coastal and interior maritime waters, their seabed and margins, including marine and terrestrial protection zones from the 30 m isobath to a line 500-1000 m inland from the sea margin (50 m inland from maximum high water) (Decree-Law 159, 2012).

The National Ocean Strategy (*Estratégia Nacional para o Mar* – ENM) is the national policy for the Ocean. The ENM was first published in 2006. A new strategy was put up for public consultation in March 2013, and was approved on November 16th 2013 (DGPM, 2013). The revised National Strategy clearly reflected the focus on Blue Growth of the European Integrated Maritime Policy (IMP) and of the new proposed Directive for MSP and ICM. The EC views "Blue growth" as "an initiative to harness the untapped potential of Europe's oceans, seas and coasts for jobs and growth." (European Commission, 2012, p.2). The ENM's proposed vision for the period 2013-2020 is that "the Portuguese Sea is a national goal/ambition whose potential will be fulfilled through the economic, social and environmental valorization of the ocean and coastal zones for the benefit of all Portuguese" (Governo de Portugal, 2013a, p. 55). The new strategy's objectives are mainly framework (*sensu* Defra, 2006), economic, and, to a lesser extent, environmental. There is also an objective of development of the knowledge base (cf. Table 2).

In terms of MSP, there was a first planning exercise for the Exclusive Economic Zone (EEZ) of the mainland – the POEM –

Table 3. ENGIZC measures (M) potentially related to ENM. MPA: Marine Protected Area; R&D: Research&Development.

M01	Strengthen and promote a normative framework for coastal zone (CZ) management
M03	Clarify licensing procedures of main activities valorizing specific resources carried out in the CZ
M04	Complete the constitution of a coherent and integrated network of MPAs
M06	Promote integrated management of coastal mineral resources
M08	(Re)evaluate the need of "hard" coastal engineering
M09	Incorporate in contingency plans specific risks of CZ
M12	Create a strategic reference framework for the development of economic activites with high added value aimed at valorizing marine resources
M13	Promote favourable conditions to host and develop recreational boating and sustainable tourism
M14	Promote technical publications on good practices for sustainable uses and activities in the CZ
M15	Create a R&D knowledge platform for the CZ
M16	Ensure adequate technical training adapted to the demands of ICM
M17	Promote development of cooperation mechanisms between states/regions in terms of ICM
M18	Develop a national monitoring program for coastal systems, biotic communities and environmental quality
M19	Put in place a cooperation platform involving public and private institutions to be a mechanism for the integrated interpretation of the evolution of the CZ
M20	Develop a CZ information and awareness program

Table 4. ENM Program Areas (*Áreas Programáticas*, AP) potentially related with ENGIZC measures.

	ENM	ENGIZC
	Governance	
AP1	Administration	M01
AP2	Strategic thinking and action	M12
AP3	Education, Science and Technology	M20
AP4	Identity and culture	-
AP5	Protection and Safeguard	M18
	Natural resources – system	
AP1	Ocean (environmental and anthropogenic pressures on fisheries; indicators; MPAs)	M4
AP2	Atmosphere (research)	M18
AP3	Integrated system (observation, risk evaluation, impact mitigation, preservation)	M18
	Natural resources – living resources	
AP1	Fisheries and industry (fish. related products)	
AP2	Aquaculture (zoning)	M03
AP3	Marine biotechnology	
	Natural resources – non-living resources	
AP1	Mineral and marine resources (exploitation)	M06,09, 12
AP2	Marine energy resources	
	Other uses and activities	
AP1	Ports, transportation and logistics	M09
AP2	Recreation, sports and tourism (recreational boating)	M13
AP3	Ship building and repair	M09
AP4	Maritime works (coastal engineering): research, exploitation & preservation	M08

which started in 2008 and underwent public consultation in 2010-2011. In 2012, a governmental dispatch determined that the studies making up the POEM would be published online but made no determination regarding the validity/implementation of the plan (Dispatch 14449, 2012).

A draft Framework Law for Maritime Spatial Planning and Management is currently being discussed in the Portuguese Parliament (Draft Law no. 133/XII, 2013). Its stated objective is the "promotion of economic, rational and efficient exploitation of marine resources and ecosystem services, ensuring compatibility and sustainability of the diverse uses and activities developed within it, considering the intergenerational responsibility in the spatial use of the national maritime space, and aiming at job creation" (ibid., p.7). It creates two new figures of planning instruments in the Portuguese legal framework: situation plans (*planos de situação*) and allocation plans (*planos de afectação*): the former should identify protection and preservation sites of the marine environment and the spatial and temporal distribution of present and potential uses and activities; the latter should allocate areas and/or volumes to different uses and activities.

Tables 3 and 4 highlight measures contained in the ENGIZC and program areas proposed in the ENM (Governo de Portugal, 2013b) that may be relevant for the integration of ICM with MSP.

Articulating ICM with MSP in Portugal

The analysis of the emerging Portuguese policy and planning framework for ICM and MSP highlighted aspects that may constitute challenges to their effective integration:

- **Coordination between coastal and maritime policies and strategies is unclear:** The ENGIZC highlighted the need to be closely integrated with the ENM. The new ENM refers the need to establish articulation mechanisms between coastal and ocean management (and MSP) (Governo de Portugal, 2013b), but makes no reference to the ENGIZC. References to the articulation with ICM relate mainly to spatial planning and to the national action plan to protect and valorize the littoral (APA, 2012). Although, as in the previous version (Carneiro, 2007), the ENM "appears to attempt to establish a bridge between the ocean policy and the ICZM strategy (ibid., 431), an unclear coordination between them may lead either to duplicated efforts or to lack of implementation of certain program areas.
- **Unclear articulation between spatial plans for coastal and maritime zones**: Although there are still no plans in place for the maritime space, there will be territorial overlap between plans for the coastal zone (POOCs) and for the areas open for maritime spatial planning and management (cf. Figure 1). POOCs were created 20 years ago and they have at least 15 years of implementation. Situation and allocation plans for MSP are new planning figures, and it is still unclear what they will encompass, how they will work and how they will be articulated with plans for the coastal environment. Under existing national legislation, POOCs are spatial plans of national relevance whose articulation with all other spatial plans for the terrestrial territory is defined in a national framework law for spatial planning and urbanism. Such a law is currently also under revision. The proposed new law states that, when necessary, plans for the terrestrial and the maritime environment shall be articulated and be made compatible "in accordance with the law" (Draft Law no 183/XII, 2013, p.38). This wording is very vague and does not explain how this articulation will be achieved; including if there will be prevalence of one type of plans over the other (hierarchical relationship).

- **Institutional articulation is unclear**: Up until recently, there was one ministry responsible for coastal and ocean policy and planning in Portugal – the Ministry of Agriculture, Sea, Environment and Spatial Planning (*Ministério da Agricultura, Mar, Ambiente e Ordenamento do Território*, MAMAOT,). In 2013, a government reshuffle divided it in two: the Ministry of Agriculture and Sea (*Ministério da Agricultura e do Mar*, MAM) and the Ministry of Environment, Spatial Planning and Energy (*Ministério do Ambiente, do Ordenamento do Território e da Energia*, MAOTE). MAM, through the national Directorate-General For Maritime Policy (*Direcção-Geral de Política do Mar*, DGPM) has responsibility over maritime spatial planning. The ministry of the Environment, through the National Environmental Agency (*Agência Portuguesa do Ambiente*, APA) has jurisdiction over coastal zone planning and management. Although such a split does not make it impossible for the two agencies to work together, additional effort will be required to coordinate and communicate at a technical level.
- **Mismatched objectives**: In order to promote effective articulation of ICM with MSP, relevant policies should have matching or shared objectives. Whereas the national strategy for ICZM and the national plans for spatial planning of the coastal zone prioritize environmental concerns, these seem to be secondary in the ENM and non-existent in the objective of the draft law for MSP and management, which is clearly oriented towards an economic objective. In this instance, how can both policies be matched?
- **Indicators to evaluate the environmental effects of policies and plans for the coast and ocean are not defined:** Indicators are the link between objectives and action in man**a**gement (IOC, 2006; Day, 2008; Ehler and Douvere, 2009; Douvere and Ehler, 2011). To understand policy/plan performance, i.e., what is happening to the environment and/or natural resources as a result of the implementation of plans and policies, it is vital to evaluate their effects, namely, through the use of environmental indicators (Johnson, 2008). As mentioned above, it is unclear if an evaluation of the ENGIZC has been performed. The new ENM proposes to address this by developing a monitoring framework, and a corresponding set of appropriate indicators.
- **Unclear articulation between management measures relevant for integration of ICM and MSP: A**s Alves et al. (2013) point out, Portuguese ICM and MSP "needs strict articulation and balancing of coastal and marine management tools" (p.1032). Although there is a parallel between measures proposed in the ENGIZC and in the ENM (cf. Tables 3 and 4), that does not ensure that their implementation will be articulated.

As mentioned above, this analysis is based on the Portuguese national policies and legislation available as of November 2013. While some were just finalized, others are undergoing discussion in the Portuguese Parliament. It will be interesting to analyze, in the coming years, if and how, despite these perceived mismatches, their implementation and articulation will take place.

CHALLENGES IN MATCHING ICM AND MSP

In the previous section we highlighted the main aspects of the Portuguese political and planning framework for ICM and MSP, and how, if not carefully approached, they may impair the necessary articulation between coastal and maritime planning and management. Tackling the abovementioned mismatches is a first step towards such integration.

Throughout the world, there are already some noteworthy examples. For instance, the USA has adopted a Federal (national) policy of Coastal and Marine Spatial Planning (CMSP). New marine spatial plans (recently developed or underway), usually encompassing the territorial seas of each State, are being merged with existing (sometimes decades old) statewide coastal zone management programs, and are being managed (or at least centralized) by the same agencies (e.g. OCMP, 2013; RICRMC, 2010). Such practice contributes to promote effective integration of data, maps, etc., and also to coherence between goals, objectives, indicators and management actions. It must be highlighted that States have only jurisdiction over their territorial sea, which in most cases, extends to 3 nautical miles. Consistency of planning options and management actions between State and Federal waters is ensured by a tool called 'Federal consistency'.

Although approaches vary, coastal nations throughout the world face similar challenges in effectively integrating the planning and management of these two very different environments. Some main challenges include, in no particular order:

- ***Integrating MSP and ICM requires flexibility and novel approaches*** as it brings together different technical languages/expertise, including an adaptation of traditional planning practices (coastal planning being usually tilted towards its terrestrial component and being different from planning for a 3-D fluid/dynamic environment), merging of different work scales, etc.
- ***People and institutions resist change***. Integrating coastal and maritime planning requires bringing together and articulating different governance structures/jurisdictions, sometimes restructuring existing institutions or creating new ones, and may bring about shifts (often perceived as losses) in traditional power balances. Because integration of ICM and MSP is also required across national borders, this challenge is expanded.
- ***Public participation and stakeholder involvement***, which are key both for MSP and for integrated coastal planning and management processes, are often still considered as time-consuming and expendable parts of the planning process. However, they are unique venues to highlight issues or concerns that would not otherwise standout, as they are often not organized in stakeholder groups, such as non-consumptive recreational uses (e.g. surfing, beachgoing or seascape aesthetics).
- ***Different languages and terminologies:*** the adoption of a sistemic approach implies i.a., the breaking of a number of linguistic barriers within and among institutions and practitioners. Such barriers may be caused by different backgrounds, training, and experiences. These hurdles are twofold: not only established terms (e.g. "sustainability") may have different meanings for different people in the same team, potentially undermining discussions, but the plethora of terms and acronyms related to the field (e.g. ICM, ICZM, CMSP, ICOM, MSP) may give an erroneous impression of distinct approaches and methodologies when, in fact, they may be different names for the same thing.
- ***Adopting a systemic vs. a sectoral approach*.** Although this should already be the focus of ICM and MSP, it is still difficult to implement in practice, because of the complexity of the issues at stake. This comprehends tackling the mismatches mentioned in this and previous sections and more. One critical aspect is considering human activities taking place on land and how they affect coastal and marine

environments (e.g. through drainage baisins and atmospheric pathways), and integrating them in planning and management of coastal and maritime spaces.

- ***Finding appropriate indicators.*** Coming up with relevant indicator sets for the monitoring and evaluation of overlapping coastal and marine policies and plans poses specific challenges, such as finding common management objectives, establishing links between activities (pressures) and impacts, selecting common priority indicators to monitor, and defining comparable methodologies to allow results to be adequately compared. In this respect, the European Environment Agency list of indicators for coasts and seas (EEA, 2013), could be an interesting starting point for the definition of such a set of integrated indicators.

Effectively integrating ICM and MSP is a new challenge for most coastal nations and a paramount step towards achieving sustainable human development. From the rivers to the sea, policies, management plans, institutions, and society at large must work together to tackle the number and magnitude of the challenges involved. Understading what they are and looking for appropriate ways to approach them should be every coastal nation's priority in the coming years.

As one of Europe's (and the world's) largest maritime nations, Portugal has a very important role to play in paving the way and setting an example for other coastal nations worldwide. The Portuguese experience in the last 20 years with integrating coastal and marine planning and management, has been rich in "enthusiastic" launches of new initiatives, which, despite "good intentions and commitment of many professionals", were then "undermined by the lack of continuing political support" (Carneiro, 2007, p. 431). Hopefully, this will no longer be the case. The mismatches highlighted in this analysis provide pointers to aspects that, if appropriately tackled, can contribute to a more effective integration of ICM and MSP in Portugal and in other coastal nations.

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Gold Rush or Pandora's Box? Toward a Transparent and Measured Approach to Marine Spatial Planning in Portugal

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Abstract

This article explores the new legal framework for marine spatial planning (MSP) in Portugal. The main focus of the analysis is on the drivers of MSP processes, the consideration given to existing vs. new uses, and on the evaluation of alternatives, based on the U.S. experience, with a focus on perceptions of U.S. MSP practitioners. The Portuguese framework for MSP may lead to favoring new uses over existing ones and defines ambiguous criteria for the selection of alternatives that are mostly financial in nature. The article draws attention to the potential environmental, social and economic risks of improperly addressing competing marine uses in the new Portuguese MSP framework.

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maritime spatial planning (MSP) – conflicting uses – evaluation of alternatives – U.S.-Portugal comparative study – sustainable marine spatial planning

Introduction

Despite being a relatively small country in terms of its terrestrial area (c. 92,000 km^2), Portugal is one of the European Union's (EU) biggest maritime nations. Currently, Portugal's maritime area (0–200 nautical miles (nm)) totals c. 1,700,000 km^2, including the Exclusive Economic Zones (EEZs) of the mainland and of the archipelagos of Madeira and the Azores,[1] making it one of the biggest EEZs in the territory of the EU.[2] Portugal has also submitted a proposal to the United Nations Commission on the Limits of the Continental Shelf (CLCS) for the extension of its continental shelf, which, if accepted with no further requirements by the CLCS,[3] will add another 2,100,000 km^2 to Portugal's maritime area, making it one of the world's largest maritime nations.[4] Portugal's EEZ, including the seafloor and subsoil, are potentially rich in living and non-living resources and interest in the exploitation of this maritime territory is growing.[5] Additionally, the country's geographic position, peripheral in the framework of the European landmass, but ultra-central in terms of its maritime domain, gives it a unique geostrategic position between Europe and the rest of the world. As such, the way Portugal implements its maritime policies, particularly marine spatial planning (MSP),[6] will arguably influence planning and

1 M Bessa Pacheco, *Medidas da Terra e do Mar* (Instituto Hidrográfico, Lisbon, 2013) at p. 14.

2 Sea Around Us Project, *Exclusive Economic Zones*. Available at http://www.seaaroundus.org/eez/; accessed 30 September 2013.

3 In accordance with Article 77 of the United Nations Convention on the Law of the Sea (LOSC), Montego Bay, 10 December 1982, in force 16 November 1994, 1833 *UNTS* 397.

4 Bessa Pacheco (n 1) at p. 33.

5 Governo de Portugal, *National Ocean Strategy 2013–2020* (Uzina Books, Lisbon, 2014), at p. 52.

6 For background references on MSP see, e.g., C Ehler and F Douvere, *Visions for a Sea Change. Report of the First International Workshop on Marine Spatial Planning* (UNESCO, Paris, 2007); C Ehler and F Douvere, *Marine Spatial Planning: A Step-by-step Approach toward Ecosystem-based Management*. IOC Manual & Guides No. 53, ICAM Dossier No. 6. Intergovernmental Oceanographic Commission (UNESCO, Paris, 2009); C Ehler, 'Conclusions: Benefits, lessons learned, and future challenges of marine spatial planning' (2008) 32 *Marine Policy* 840–843; C Ehler, 'Perspective: 13 Myths of Marine Spatial Planning' (2012) 5(5) *Marine Ecosystems and Management* 5–7.

management of the European marine space, as well as the interpretation and outcomes of European policies.

In February 2014, the Portuguese government published a National Ocean Strategy (NOS 2013–2020).[7] Two months later, in April 2014, the Portuguese parliament passed a national law establishing the Basis of the Policy for Marine Spatial Planning and Management (MSPM) of the National Maritime Space (MSPM Law).[8] In March 2015, a Decree-Law was published developing important aspects of the implementation of the MSPM Law (Decree).[9]

Recent attention to the ocean and to the development of Portugal's marine policy framework is largely consistent with the EU's political seascape developed over the last decade.[10] This includes the Integrated Maritime Policy,[11] the Marine Strategy Framework Directive (MSFD),[12] the Blue Growth Strategy,[13] the MSP Roadmap[14] and the MSP Directive.[15] The EU MSP Directive stipulates that: "When establishing and implementing MSP, Member States shall consider economic, social and environmental aspects to support development and growth in the maritime sector, applying an ecosystem-based approach, and

7 Resolution of the Council of Ministers 12/2014 of 12 February, *Diário da República* I 30/1310, (12.02.2014); NOS 2013–2020 replaced a first National Ocean Strategy (NOS 2006–2016) published in 2006.

8 Law 17/2014 of 10 April, *Diário da República* I 71/2358 [hereinafter Law 17/2014]. The MSPM Law ensues directly from the NOS 2013–2020 (n 7).

9 Decree-Law 38/2015 of 12 March, *Diário da República* I 50/1523 [hereinafter Decree-Law 38/2015].

10 Governo de Portugal (n 5), at p. 50; C Frazão Santos, T Domingos, MA Ferreira, M Orbach and F Andrade, 'How sustainable is sustainable marine spatial planning? Part I—Linking the concepts' (2014) 49 *Marine Policy* 59–65.

11 *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An Integrated Maritime Policy for the European Union*. COM(2007) 575 final, Brussels, 10 October 2007.

12 Directive (EC) 2008/56 of the European Parliament and of the Council, 17 June 2008, establishing a framework for community action in the field of marine environmental policy [2008] OJ L164/19 [hereinafter MSFD].

13 *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Blue Growth opportunities for marine and maritime sustainable growth*. COM(2012) 494 final, Brussels, 13 September 2012.

14 *Communication from the Commission: Roadmap for Maritime Spatial Planning: achieving common principles in the EU*. COM(2008) 791 final, Brussels, 25 November 2008.

15 Directive (EU) 2014/89 of the European Parliament and of the Council, 23 July 2014, establishing a framework for maritime spatial planning [2014] OJ L257/135 [hereinafter MSP Directive].

to promote the coexistence of relevant uses and activities".[16] In other words, conflict prevention through comprehensive analysis of alternatives, and focusing on their environmental implications, is at the core of the EU's approach to MSP.[17] The Portuguese MSPM Law also states that MSP and management of the national maritime space must prevent or minimize possible conflicts between uses and activities.[18] At present it is relevant to analyse how the Decree which develops the MSPM Law addresses the compatibility of diverse uses and the prevention of conflict among potentially competing uses in the Portuguese national maritime space.[19]

The EU's experience and policy framework for MSP directly influenced the current Portuguese policy landscape for the ocean, including this Decree. Recognizing the value of recent and ongoing dialogue on ocean governance between the U.S. and Europe (e.g., the CALAMAR project, the Dräger Foundation's EU-U.S. conference series, the Galway Statement),[20] it is timely

16 MSP Directive, Article 5(1).

17 The EU adopts a triple bottom-line approach to MSP. BS Halpern, CJ Klein, CJ Brown, M Beger, HS Grantham, S Mangubhai, M Ruckelshaus, VJ Tulloch, M Watts, C White, and HP Possingham, 'Achieving the triple bottom line in the face of inherent trade-offs among social equity, economic return, and conservation' (2013) 110(15) *PNAS* 6229–6234.

18 Law 17/2014, Article 4.

19 On 16 January 2015, a seminar was organized at FCSH—New University of Lisbon to discuss the current Portuguese legal framework for MSP and particularly the Decree. Invited speakers from academia and civil society unanimously highlighted the document's frailty and their apprehension concerning a number of aspects, including: the disconnect with the land planning system, conflict with the statutes of the autonomous regions, vagueness of some concepts, differential treatment given to activities and insufficient consideration of environmental issues. MA Ferreira, H Calado, C Pereira da Silva, AD Abreu, F Andrade, M Chantal Ribeiro, C Fonseca, E Gonçalves, J Guerreiro, F Noronha, M Pereira, C Pinto Lopes, Y Stratoudakis and L Vasconcelos, *Relatório final do Debate Mar Português: Contributo para o Ordenamento Espacial* (CICS.NOVA/FCSH-UNL e CIBIO/UAç. FCSH-UNL, Lisbon, 2015) 1–25. Available at: http://www.fcsh.unl.pt/e-geo/sites/default/files/dl/site2014/Relatorio_Debate_Mar_Portugues.pdf; accessed 9 February 2015 [hereinafter Seminar Report]; *ibid.*, 'Contributions towards maritime spatial planning (MSP) in Portugal–Conference Report' (2015) 59 *Marine Policy* 61–63.

20 CALAMAR—Cooperation across the Atlantic for Marine Governance Integration. Online at http://calamar-dialogue.org/; accessed 4 May 2015; Dräger Foundation EU-U.S. Conference Series: "Sustainable Oceans: Reconciling Economic Use and Protection. Online at http://www.draeger-stiftung.de/en/foundation-programs/conferences-2013/sustainable-oceans.html; accessed 4 May 2015; Galway Statement on Atlantic Ocean Cooperation: Launching a European Union—Canada—United States of America Research Alliance. Online at http://ec.europa.eu/research/iscp/pdf/galway_statement_atlantic_ocean_cooperation.pdf; accessed 4 May 2015.

to also consider the U.S. experience in MSP processes. In particular, understanding how the U.S. has addressed competing uses, and evaluated alternatives, may be relevant to any discussion of parallel European and Portuguese efforts.

This article is structured as follows: the Methods section sets out the different approaches taken for the analysis of the Portuguese case, whose legal framework for MSP has just been completed but not yet implemented, and for an account of the U.S. experience in MSP, based on perspectives of stakeholders involved in actual MSP processes; to provide background for the discussion, a section on the Portuguese legal framework for MSPM presents those aspects of the recently approved legislation which are relevant for the discussion of the approach to competing uses and evaluation of alternatives; the ensuing section offers an oversight of the U.S. MSP experience in terms of drivers, protection of existing uses, and full cost-benefit analysis of alternatives, which then paves the way for the critical analysis of these same three aspects in the current Portuguese framework and informs concerns over the future of Portuguese MSPM.

Methods

For the Portuguese case, where no marine spatial plans are implemented yet and the legal MSPM regime has just been finalized, a critical analysis of certain aspects of these legal documents was conducted. In particular, the authors analysed the Decree developing the Portuguese MSPM Law to unveil the aspects relevant to the discussion of the competing marine uses and the evaluation and comparison of alternatives. This analysis was supported by a literature review and sources from the media.

For the analysis of the U.S. experience, a mixed methodology was used. This included a review and analysis of online and paper information (plans, technical reports, guides, public information documents) pertinent to federal and state-wide initiatives on MSP in the U.S. It also included results from a series of interviews conducted in 2013 to gather new data on the unwritten perceptions of MSP practitioners concerning MSP processes in the U.S. For that purpose, the authors derived a list of interviewees from key informants who could represent diverse marine stakeholder perspectives. These included state agencies, local governments, academia, non-governmental organizations (NGOs), and other stakeholders, including but not limited to the commercial fishing industry, currently or formerly involved in their respective MSP processes. The primary focus was on the three U.S. states most advanced in their respective MSP

processes at that time: Massachusetts (MA), Rhode Island (RI) and Oregon (OR). Practitioners from Washington (WA) and California (CA) were also interviewed. Greater emphasis is placed on Oregon, where the first author was on a professional exchange and conducted twenty-one semi-structured interviews (see Table 1) per standard social science protocol.[21] The interviews were designed around a list of topics related to the MSP process, focusing on: (a) the drivers of the process, (b) the consideration given to new and existing uses, and (c) aspects related to the evaluation of alternatives. The interviews emphasized open-ended questions. It was assumed that the interviewees would guide the discussion towards topics of genuine concern. Research results include stakeholders' impressions or perceptions without determination of accuracy.

Interviews took place in person or by telephone between May and July 2013. All interviews were recorded (contingent on participants' permission) to enhance accuracy and completeness of the data record and later analysed for content.

TABLE 1 *Categories and numbers of stakeholders interviewed.*

Coast	State	Stakeholder group	# interv.	Total
West	Oregon, Washington, and California	Fishing industry	6	17
		State agencies	7	
		Local government	2	
		Academia	2	
East	Rhode Island and Massachusetts	State agency	2	4
		Academia	1	
		Private-public partnership	1	

21 HR Bernard, *Research Methods in Anthropology: Qualitative and Quantitative Approaches* (4th ed., Altamira Press, Oxford, 2006); BL Berg and H Lune, *Qualitative Research Methods for the Social Sciences* (8th ed., Pearson Education, Inc., Upper Saddle River, NJ, 2012); C Robson, *Real World Research: A Resource for Social Scientists and Practitioner Researchers* (2nd ed., Blackwell, Malden, MA, 2002).

Portugal's Legal Framework for Marine Spatial Planning and Management

In April 2014, the Portuguese parliament passed the national MSPM Law.[22] Its stated objectives are

> the promotion of economic exploitation, [one which is] sustainable, rational and efficient, of marine resources and ecosystem services, ensuring the compatibility and sustainability of the diverse uses and of the activities developed therein, considering the inter- and intra-generational responsibility in the use of the national maritime space and aiming at job creation.[23]

The MSPM Law created the national system for MSPM. The system includes two types of instruments:[24] strategic policy instruments (namely, the National Ocean Strategy), and spatial planning instruments, which can be of two types—situation plans and allocation plans.[25]

On 12 March 2015, a Decree was published establishing the rules for the application of the Portuguese MSPM Law (establishing the framework for future developments), and transposing the EU MSP Directive to the national legal framework. The main aspects covered in the Decree are:

a) the regime for the elaboration, approval, amendment, revision and suspension of MSP instruments;
b) the legal regime applicable to the private use titles of the national maritime space;
c) the financial and economic regime associated to the private use of the national maritime space;
d) the permanent monitoring and technical evaluation regimes of the national MSP; and
e) the private use regime of water resources in coastal and transition waters for aquaculture.[26]

22 Law 17/2014.
23 *Ibid.*, at Article 4(1).
24 *Ibid.*, at Article 6.
25 *Ibid.*, at Article 7(1).
26 Decree-Law 38/2015, Article 1(1).

Next, we highlight the main aspects of the Decree related to the situation and allocation plans and to the consideration of existing uses and the evaluation of alternatives.

Situation Plan

The situation plan "represents and identifies the spatial and temporal distribution of existing and potential uses and activities, and identifies the natural and cultural values of strategic relevance for environmental sustainability and intergenerational solidarity".[27] It encompasses the entire national maritime space (NMS).[28]

The Decree stipulates that the situation plan will identify the spatial and temporal distribution of existing and potential uses and activities. Specifically it lists:

i. aquaculture and fishing, when associated with a structure built for that effect;
ii. marine biotechnology;
iii. marine mineral resources;
iv. energy resources and renewable energies;
v. scientific research;
vi. leisure, sports and tourism;
vii. underwater cultural heritage; and
viii. infrastructure.[29]

The situation plan will also indicate areas and/or volumes important for nature, biodiversity and ecosystem services conservation, national defense infrastructures, and cultural values, and identify navigation lanes, dredging and dumping grounds, submarine cables and pipes, port facilities and coastal defenses, emerged shallows, artificial islands and reefs, and location of shipwrecks.[30]

The Decree states that the situation plan may or may not be subjected to Strategic Environmental Assessment (SEA) and that such a decision is incumbent on the government member responsible for sea affairs.[31] The EU's

27 *Ibid.*, at Article 9(1).
28 *Ibid.*, at Article 9(2).
29 *Ibid.*, at Article 10(1).
30 *Ibid.*
31 *Ibid.*, at Articles 12 and 13.

Strategic Environmental Assessment Directive (SEA Directive),[32] transposed to the Portuguese legal framework in 2007,[33] defines the need

> to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, (. . .), an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.[34]

Allocation Plans

According to the Decree, allocation plans "allocate areas and or volumes of the NMS to uses and activities not identified in the situation plan, setting out, where applicable, the respective use parameters".[35] Once approved, allocation plans are automatically integrated in the situation plan, which is amended for that purpose.[36] Allocation plans include the characterization of the corresponding area or volume of the NMS, the identification, description and spatial/temporal distribution of uses and activities to be developed therein, and implementation rules.[37]

The Decree stipulates that allocation plans are considered projects and may be subject to Environmental Impact Assessment (EIA)[38] in the terms of Directive 2011/92/EU,[39] transposed into Portuguese legislation in 2013.[40] The Directive applies to "the assessment of the environmental effects of those public and private projects which are likely to have significant effects on the environment".[41]

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32 Directive (EC) 2001/42 of the European Parliament and of the Council, 27 June 2001, on the assessment of the effects of certain plans and programmes on the environment [2001], OJ L197/32 [hereinafter SEA Directive].

33 Decree-Law 232/2007 of 15 June, *Diário da República* I 114/3866.

34 SEA Directive, Article 1.

35 Decree-Law 38/2015, Article 19(1).

36 *Ibid.*, at Article 19(2).

37 *Ibid.*, at Article 20.

38 *Ibid.*, at Article 23(1).

39 Directive (EU) 2011/92 of the European Parliament and of the Council, 13 December 2011, on the assessment of the effects of certain public and private projects on the environment [2011], OJ L26/1–26 [hereinafter EIA Directive].

40 Decree-Law 151B/2013 of 31 October, *Diário da República* I 211/6328.

41 EIA Directive, Article 1.

Private Use of the National Maritime Space

The NMS is one of "common use and fruition, namely for leisure".[42] In contrast to the public rights within the NMS, the possibility to privately use the NMS[43] is subject to a private use title (see Table 2). A private use title obligates its holder to an effective use, as defined in the allocation plan, and determines the duty to adopt, at all times, measures for achieving/maintaining good environmental status (GES) of the marine environment[44] and good status (GS) of coastal and transitional waters.[45] Upon the extinction of the title, the holder is obligated to "... restore modified *physical conditions that do not result in a benefit*".[46]

Private Use Fee for the National Maritime Space

The Decree establishes a Private Use Fee (TUEM) for the NMS.[47] The TUEM is intended to compensate: the private use profit resulting from the occupation of an area or volume of the NMS; the environmental cost inherent in the

TABLE 2 *Characteristics of the private use titles of areas or volumes of the NMS.*

Type of title	Use	Max. duration	Fee
Concession	Prolonged use (uninterrupted use >= 12 months)	50 years	Yes
License	Temporary (<12months), intermittent, seasonal use	25 years	Yes
Authorization	Applied scientific research; pilot projects for new uses/technologies or non-commercial activities	10 years	Exempted

42 Decree-Law 38/2015, Article 46(1).

43 Any use requiring reservation of an area or volume to a use of the environment or marine resources or ecosystem services superior to one obtained by common use and which results in a benefit (advantage) to the public interest. *Ibid.*, at Article 47.

44 In accordance with the requirements of the MSFD, Article 1.

45 In accordance with Directive (EC) 2000/60 of the European Parliament and of the Council, 23 October 2000, establishing a framework for Community action in the field of water policy [2000] OJ L 327/ 1.

46 Decree-Law 38/2015, Article 48(4) (emphasis added); for meaning of "benefit", cf. (n 43).

47 *Ibid.*, at Article 75(1).

activities liable to cause significant impact on the NMS; and the administrative costs of spatial planning, public management, maritime safety, maintenance and inspection.[48] The TUEM is calculated as the sum of A+B+C, where *A* corresponds to the occupied area or volume of the NMS, *B* expresses the effects of uses susceptible to cause significant environmental impact and the need to ensure monitoring and to ensure GES, and *C* corresponds to needs for maritime safety services, monitoring systems, and their maintenance, inherent in the occupation of the NMS.[49]

The Decree states that the "TUEM applies to all uses or activities which imply the private use of the NMS" (including concessions or licenses, but exempting authorizations from such payments), specifying, however, that the "TUEM does not apply to the private use of the NMS for the exploration and exploitation of geological and energy resources".[50] The Decree stipulates that a proportion (37.5%) of the TUEM value will be applied to fund activities to improve MSPM and the GES of the NMS and coastal/transitional waters, and to fund and maintain maritime security services and monitoring systems.[51] Other financial guarantees, such as the need to pay a deposit and insurance, are provided for in the Decree.[52]

Existing vs. Potential Uses or Activities

Existing uses or activities are defined as "those being developed under a private use title of the NMS," whereas "potential uses or activities" are "those identified

48 *Ibid.*

49 *Ibid.*, at Article 78.

50 *Ibid.*, at Article 76. Questioned on the reasons for such an exemption, at a public session held in Lisbon at VdA on 26 March 2015 (online at http://www.vda.pt/pt/comunicacao/eventos/A-implementacao-da-LBOGEM-Principais-Novidades/10202/; accessed 8 April 2015), a public official stated that it was a "political option", because these activities are regulated by a different ministry and already subject to payment of a tax.

51 *Ibid.*, at Article 86.

52 The Decree stipulates the need to pay a deposit and insurance. It provides that the holder of a private use title is liable for all losses caused by structures related to the title. In the case of concessions or licenses, the title holder is required to pay a deposit to ensure the maintenance of biological, physical and chemical conditions of the marine environment and the removal of mobile structures installed. Upon termination of the title, the deposit is returned after the holder restores altered environmental conditions which do not translate into a benefit to the marine environment and removes related constructions, except when the public benefit of its maintenance exceeds that of its removal. Payment of a deposit can be waived when the use or activity is not likely to alter pre-existing environmental conditions. Title holders must also secure liability insurance to ensure the obligation to pay compensation to cover any damage to third parties. *Ibid.,* at Articles 66–67.

as liable to be developed in the areas and or volumes identified in the situation plan, to which a private use title has not yet been attributed".[53]

Conflicting Uses or Activities

The Decree defines preference criteria to be used during the elaboration of allocation plans, when comparing existing or potential conflicting uses or activities to determine the prevailing one.[54] It establishes that, provided that biodiversity values and the GES of the marine environment and GS of coastal/transitional waters are guaranteed, the following preference criteria should be used:

a) Greater social and economic benefit (advantage) to the country; and
b) Maximum coexistence of uses or activities (when the first criterion doesn't apply or when conflicting uses and activities are equally valued under it).

Also according to the Decree, the first criterion is to be evaluated according to the following parameters, each with equal weighting:

a) Number of jobs created;
b) Qualification of human resources;
c) Volume of the investment;
d) Economic viability of the project;
e) Forecasted results;
f) Contribution to sustainable development;
g) Value creation;
h) Expected synergies in related activities; and
i) Social responsibility of interested parties in the development of the use or activity.

Preference will be given to the use or activity with the highest score.[55]

The Decree highlights that preference for a given use/activity may imply relocation of existing uses/activities (ideally to a nearby, comparable location). Should relocation be due to environmental reasons, the cost of this relocation is supported by the Portuguese State.[56]

53 *Ibid.*, at Article 9(3).
54 *Ibid.*, at Article 27.
55 *Ibid.*
56 *Ibid.*, at Articles 28 and 29.

Transitional Dispositions

Until the adoption of the situation plan (no more than six months from the publication of the Decree), the Portuguese Maritime Spatial Plan—POEM, a plan developed between 2008 and 2010 for the EEZ of the Portuguese mainland and published as a study[57] in 2012, is to be considered as the reference situation for MSP of the NMS and for the allocation of new private use titles.[58] The same article stipulates that the instruments for the protection and preservation of the marine environment that have been approved by the governments of the autonomous regions[59] prior to this Decree will be taken into consideration when approving or amending the situation plan. However, in the case of a substantiated need to safeguard national interests, when approving or revising MSP plans, the national government may determine the total or partial non-integration, or the exclusion of such instruments.[60]

Concerns Raised by This Decree

The MSPM Law expressly states the objective of achieving compatibility of diverse marine uses. Arguably, this is not restricted to uses requiring a private use title of the NMS, because common use (including, for example, leisure) does not require such a title. However, by defining existing uses/activities as those being developed under a private use title of the NMS, the Decree leaves out all other activities which do not have such a requirement, severely constraining the potential effectiveness of the compatibility objective.

The criteria set out for the determination of a preferred use or activity (e.g., job creation, volume of investment, forecasted results, value creation, economic viability, and contribution to sustainable development) seem to further bias the system towards new or emerging activities.

The establishment of a private use fee for the NMS and the added requirement to pay a deposit, *i.a.*, to ensure the maintenance of physical, chemical and biological conditions, and to secure liability insurance, are important positive proposals.[61] The exemption from the TUEM awarded to the exploration

57 For more information on the POEM process and outcome, cf. H Calado and J Bentz, 'The Portuguese Maritime Spatial Plan' (2013) 42 *Marine Policy* 325–333; C Frazão Santos, T Domingos, MA Ferreira, M Orbach and F Andrade, 'How sustainable is sustainable marine spatial planning? Part II—The Portuguese experience' (2014) 49 *Marine Policy* 48–58; F Noronha, *O Ordenamento do Espaço Marítimo* (Almedina, Coimbra, 2014).

58 Decree-Law 38/2015, Article 104(1).

59 Portuguese archipelagos of Madeira and the Azores.

60 Decree-Law 38/2015, Article 104(4).

61 *Ibid.*, at Articles 66 and 67. It is important to note that the liability insurance makes no reference to environmental liability, which should clearly be covered. Also, who has the

for and exploitation of geological and energy resources is a concern, particularly considering the well-documented potential environmental impacts of such activities.[62] These aspects combined suggest a focus on the promotion of new activities over existing uses, and of the private over public, or common, interest. Evaluation of the effective sustainability of present and new uses also appears not to be duly considered.

An Account of the U.S. Marine Spatial Planning Experience

In this section, we explore some aspects of the U.S. experience, namely those related to the incorporation (or not) of existing uses in MSP processes, and other important aspects to consider in an analysis of alternatives, which may be helpful to the Portuguese case. An emphasis is given to the opinions voiced by the MSP practitioners interviewed, in terms of the drivers of MSP processes in the U.S. that influence the planning process and outcomes, how existing uses are considered, and key aspects to be considered in an analysis of alternatives.

In the U.S., marine jurisdiction is shared between states (mostly out to three nm, with few exceptions) and the federal government (from three to 200 nm off shore). For many years, the federal government has been engaged in mapping federal waters, and in the early 2000s it became involved in promoting

economic capacity to pay a deposit for environmental damage associated, e.g., to an accident such as the Deepwater Horizon?

62 Cf. L Drew, 'The Promise and Perils of Seafloor Mining' (2009) *Oceanus Magazine*, Woods Hole Oceanographic Institution (WHOI). Available at http://www.whoi.edu/oceanus/feature/the-promise-and-perils-of-seafloor-mining; accessed 23 January 2015. It reports on the results of a conference on seabed mining convened by scientists at the Woods Hole Oceanographic Institution (WHOI), which included "a wide range of stakeholders from 20 countries". With regard to the impacts of offshore oil drilling, the Deepwater Horizon oil spill in 2010 in the Gulf of Mexico is the most recent example. It is estimated to have released 4.9 million barrels of crude oil into the marine and coastal environment of the Gulf of Mexico and is thought to be one of the worst environmental disasters in the U.S., whose long-term impacts are still to be determined. IA Mendelssohn, GL Andersen, DM Baltz, RH Caffey, KR Carman, JW Fleeger, SB Joye, Q Lin, E Maltby, EB Overton and LP Rozas, 'Oil Impacts on Coastal Wetlands: Implications for the Mississippi River Delta Ecosystem after the Deepwater Horizon Oil Spill' (2012) 62(6) *BioScience* 562–574. The Ocean Conservancy has compiled a list of studies on the spill, which suggest that impacts are widespread across marine and coastal ecosystem components, including humans. Ocean Conservancy, 'Four years after the BP Deepwater Horizon Oil Disaster Impacts and Studies' (2014). Available at http://www.oceanconservancy.org/places/gulf-of-mexico/pdf-4-years-after-bp.pdf; accessed 23 January 2015.

and developing sound MSP as a policy for wise sea use and conflict reduction. Because 35 American coastal states manage their jurisdictional waters (to 3 nm), it is up to each one to develop its own MSP process and final plan.

Drivers of Marine Spatial Planning Processes

Research participants from Massachusetts, Rhode Island, Oregon, California, and Washington identified two main drivers for the beginning of formal MSP processes in the U.S.: a growing focus on the development of offshore wind technologies and marine renewable energies, and the Obama Administration's National Ocean Policy.[63]

Marine Renewable Energy (MRE): MRE projects include offshore equipment arrays for harvesting kinetic energy from wave, wind, tidal, and current sources. Prospects for, and concern with, the development of MRE projects were the main drivers identified by all but one of the research participants for the onset of MSP efforts in the U.S., a notion confirmed in the plan documents and related literature.[64]

In the early 2000s, various MRE companies filed applications for exploratory permits in the territorial seas (to 3 nm) and federal waters off Massachusetts and Rhode Island, Oregon, California, and Washington. The East Coast development proposals concerned offshore wind energy, and several applications for wave and tidal energy projects were filed for West Coast waters.[65] Participants also referred to the prospect of job creation generated by MRE projects as

63 White House, 2010. Executive Order 13547—Stewardship of the Ocean, Our Coasts, and the Great Lakes. Available at http://www.whitehouse.gov/the-press-office/executive-order-stewardship-ocean-our-coasts-and-great-lakes; accessed 13 April 2013.

64 RICRMC, 'Rhode Island Ocean Special Area Management Plan—vol. 1' (RICRMC, Providence, RI, 2010) Available at http://www.crmc.ri.gov/samp_ocean.html; accessed on 24 April 2013; J McCann and S Schumann with G Fugate, S Kennedy, and C Young, *The Rhode Island Ocean Special Area Management Plan: Managing Ocean Resources through Coastal and Marine Spatial Planning* (URI Coastal Resources Center/RI Sea Grant College Program, Narragansett, RI, 2013); Oregon Territorial Sea plan—Part 5. Available at: http://www.oregon.gov/LCD/docs/rulemaking/tspac/Part_5_FINAL_10082013.pdf; accessed 9 February 2015; Massachusetts Ocean Management Plan. Vol. 1. Available at http://www.mass.gov/eea/ocean-coastal-management/mass-ocean-plan/final-massachusetts-ocean-management-plan.html; accessed 18 April 2013; C Pomeroy, M Hall-Arber and F Conway, 'Power and perspective: Fisheries and the ocean commons beset by demands of development' (2014) *Marine Policy* (in press); http://dx.doi.org/10.1016/j.marpol.2014.11.016.

65 HV Campbell, 'Emerging from the Deep: Pacific Coast Wave Energy' (2009) 24(1) *Journal of Environmental Law and Litigation* 7–33; O Husing, *The Origins of Coastal Marine Spatial Planning* (*CMSP*) *in Oregon* (Oregon Coastal Zone Management Association, 2011).

another factor that influenced state governments to promote such projects. The majority of practitioners from the West Coast mentioned the sense of "a gold rush" on the ocean, also referred to in the literature,[66] stemming from the number of permits applied for by MRE companies before any jurisdictional and permitting procedures for MSP were in place.[67] One state agency representative summarized it as "it was the 'wild West' all over again" and one local government representative noted: "At this time the only thing protecting the Ocean, is the Ocean herself".

National Ocean Policy (*NOP*): The NOP, particularly the Interagency Ocean Policy Task Force Final Recommendations[68] and Implementation Plan[69] and the Guide for Regional Marine Planning,[70] were the second most-mentioned drivers for MSP initiatives in the U.S. states considered. The NOP identifies coastal and marine spatial planning (CMSP) as one of nine national priorities. According to research participants, this "tide of evolving thinking in the U.S." and the notion that "people felt threatened because they didn't want to be managed from Washington D.C.", led state governments and agencies to try to figure out what the implications of the NOP would be for their state and to start their MSP efforts, in an attempt to set a precedent for what the federal government could or could not do at state level.[71]

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66 For Conway and co-authors, the ocean has "in many ways, become valuable 'real estate'", and "fights over space resemble those of land-grant claims and the gold rush". F Conway, J Stevenson, D Hunter, M Stefanovich, H Campbell, Z Covell and Y Yin, 'Ocean Space, Ocean Place: the human dimensions of wave energy in Oregon' (2010) 23(2) *Oceanography* 82–91, at p. 82; cf. also Husing (n 65) at p. 5; Concerns about emerging marine industries such as deep-sea mining yielding "an underwater gold rush" have also been voiced in the press. See M Miner, 'Will deep-sea mining yield an underwater gold rush?' (2013) *National Geographic News*. Available at: http://news.nationalgeographic.com/news/2013/13/130201-underwater-mining-gold-precious-metals-oceans-environment/; accessed 23 January 2015.

67 Campbell (n 65).

68 The White House Council on Environmental Quality (CEQ), Final Recommendations of the Interagency Ocean Policy Task Force, 19 July 2010. Available at: http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf; accessed 4 February 2015.

69 National Ocean Council, 2013. National Ocean Policy Implementation Plan. Available at: http://www.whitehouse.gov/sites/default/files/national_ocean_policy_implementation_plan.pdf; accessed 4 February 2015.

70 National Ocean Council, 2013, *Marine Planning Handbook*. Available at: http://www.whitehouse.gov//sites/default/files/final_marine_planning_handbook.pdf; accessed 4 February 2015.

71 These comments' characterization of the division of duties and responsibilities between federal and state management and law is inaccurate, and capture the misunderstandings, fear, and high emotions of the time. Federal law requires the federal agency in charge to

Protection of Existing Uses

In the U.S., the protection of existing uses is a priority stated in MSP instruments. The Massachusetts Ocean Management Plan goals contemplate supporting "wise use of marine resources, including renewable energy, sustainable uses, and infrastructure," which includes the minimization of "conflicts with/impacts to existing uses and resources" and, specifically, the development of measures "for reconciling use conflicts with fisheries".[72]

Rhode Island's Ocean Special Area Management Plan (RI SAMP) lists the promotion and enhancement of existing uses as one of its four goals, second only to fostering "a properly functioning ecosystem that is both ecologically sound and economically beneficial".[73]

Oregon's enforceable Territorial Sea Plan (TSP), requires renewable energy facilities by law to "minimize the potential adverse impacts to existing resource users and coastal communities".[74] This reflects the requirements of the state's overarching ocean management goal, established in 1973, which places the highest priority on the vitality of the marine ecosystem and includes protection of existing "beneficial uses of ocean resources—navigation, food production, recreation, aesthetic enjoyment, and uses of the seafloor—provided that such activities do not adversely affect the [living marine] resources".[75] As one state agency representative explained, "existing beneficial uses are economic drivers".

At the federal level, the implementation plan of the NOP states that proposed actions are meant to "help maintain existing jobs and promote job growth" and "supporting existing and new marine industries, maintain and enhance the vitality of coastal communities and regions, and preserve the marine ecosystems that support our quality of life".[76]

However, despite written intentions, concerns were voiced during the interviews that there is a greater focus on job creation than on preserving existing jobs that sustain local and regional economies, which may endanger the livelihoods of coastal communities. One consideration shared by one West Coast participant summarizes this concern: "(agencies) are used to regulating jobs and putting conditions on existing uses, but they're not used to protecting

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defer to, and follow, a coastal state's comprehensive plan (for example, Oregon's legally enforceable land use planning, TSP, and Coastal Management Plan.)

72 Massachusetts Ocean Management Plan (n 64) at chapter 1, p. 4.

73 RICRMC, 2010 (n 65) at chapter 1, p. 6.

74 OR. REV. STAT. § 196.471 (2008).

75 OR. ADMIN. R. 660-015-0010 (2009).

76 National Ocean Council, 2013 (n 70) at pp. 6 and 7.

jobs". Many participants expressed concern about fisheries, believed to be particularly sensitive to the encroachment of new activities, especially those requiring the installation of permanent structures. One state agency representative recalled: "the fishing industry has been here from the beginning, then shipping came and took its toll, then recreation, and building ports, and now marine energies . . . it's what we call death by a thousand cuts!"

Non-consumptive recreational ocean users (surfers, boaters, and wildlife viewers) are another ocean stakeholder that can be affected by incoming uses. Eardley and Conway[77] studied this community in Oregon, and highlighted its importance in sustaining local economies. Their study showed that these generally overlooked existing uses may be directly affected by new activities, either by altered physical conditions, restricted access or depreciated seascapes, which may result in the relocation of existing uses, hindering the local economies (existing jobs) they help sustain.

Need for Full Cost-Benefit Analysis of Alternatives

Although recognizing a pressing need to find alternative energy sources to oil and gas, concerns were consistently voiced about MRE projects, namely uncertain markets, due to the estimated costs of these energies compared to existing energy sources, and uncertainty about the technological development of MRE, as the technology is generally perceived as "not being quite there yet" and as not being a viable alternative at this point to existing energy sources.

There was a generalized concern that, despite these uncertainties, administrations and agencies tend to accept the promises made by promoters without critical examination. One interviewee summarized this as being co-opted by false promises of economic interests and explained: "they (agencies) have been promised by promoters that this will be a great industry, it will produce all these jobs, and do all this wonderful stuff for the state, clean the air and everything, but they haven't done a critical analysis to really determine if the claims that are being made are true and realistic".

For these reasons, practitioners highlighted the importance of a full cost-benefit analysis of MRE projects to ensure that individual/private interests and profit do not override public benefits and the public interest. According to research participants, this full cost-benefit analysis of alternatives should include a careful estimation of:

77 CS Eardley and FDL Conway, *Oregon's Non-Consumptive Recreational Ocean User Community: Understanding an Ocean Stakeholder* (Oregon State University, Oregon Sea Grant—NOAA, 2011).

– *Maintenance costs*: The "staggering" cost of maintaining devices in sea water was repeatedly mentioned, especially by those related to the fishing industry. "There's nothing harsher, maybe outside of outer space, when it comes to devices in the ocean" and "anything steel in the ocean needs to be maintained, you can't just put it out there and say it's gonna last for 20 years".[78] Many questioned how and if such maintenance costs will add to the cost of the electricity produced and if they are being adequately considered in the financial viability analysis;
– *Removal and restoration costs*: Despite being required to ensure restoration of pre-project conditions once projects are over, promoters are perceived as resisting the need to fully remove devices and do remediation. Various practitioners voiced this concern: "Once these things are in the water, I don't care what they say, they're not getting them back up". Another participant explained: "They never get enough money to do the clean-up: it's more expensive to pick up one of these devices in deep water than it is to put them in". The general concern can be synthesized by the comment of another participant: "These companies, once they go bankrupt, they're out of here, and you (the public) are left holding the damage";
– *Displacement costs/loss of jobs*: The installation of permanent/fixed devices is seen as having the potential to displace existing uses and activities and to result in increased security issues and ultimately in loss of jobs, affecting well-established and economically productive sectors. One state official remarked that "(government) doesn't necessarily understand that there's a lot of existing users, who are preserving jobs and economies by their use of a certain space, and with the decision to exploit that same space they may be hurting one economy while they're trying to enliven another one";
– *Distribution of revenues*: This was referred to as a major concern, especially when public benefits are spread over a broader range of stakeholders and are therefore more difficult to perceive or account for. Practitioners spoke to the importance of carrying out a full analysis of the distribution of revenues (value creation) from current and prospective uses. The most common example was that of fisheries and related processing industries, estimated to yield millions of USD in revenues yearly. One research participant alluded to a common lack of attention being given to the synergies from activities related to fisheries as "the ocean

78 See also M Mueller and R Wallace, 'Enabling Science and Technology for Marine Renewable Energy' (2008) 36(4376) *Energy Policy* 4380–81.

produces tremendous amounts of food, but because it (the economic revenue) is spread out over so many people, it is overlooked. Food is just as important as electricity, but people don't see it that way".
– *Aesthetic costs*: participants were concerned that the installation of permanent devices in the water may lessen the aesthetic value of the ocean seascape and stressed that people on the coast do not want projects (and the structures that come with them) to depreciate the value of their seascape: "we don't want our views ruined by these things" and "for coastal people the ocean is their greatest asset".[79] This relates directly to the protection of existing uses referred above.

How Can This Experience Be Relevant to the Portuguese Case in the European Context?

Drivers of the Portuguese Marine Spatial Planning Process

The focus of Portugal's new ocean use/occupation legal framework and the recently approved Portuguese NOS 2013–2020 restate EU priorities for the ocean, namely "Blue Growth". In fact, the stated objective of the 2014 MSPM Law is "*the promotion of economic exploitation* (…) of marine resources and ecosystem services, (…) *aiming at job creation*".[80]

Concrete prospects for the exploitation of renewable energies, including wave and offshore wind parks (ongoing pilot projects),[81] deep-water oil drilling off of Portugal's mainland coast (projected),[82] seabed metal mining off the

79 In the U.S., an unobstructed view is part of a coastal land owner's bundle of property rights derived from English Common Law. Consequently, many states affirmatively grant riparian or littoral landowners the right to a view.

80 MSPM Law, Article 4(1); emphasis added. Cf. section on "Portugal's Legal Framework for Marine Spatial Planning and Management", above, for full text of the objectives.

81 A full-scale prototype of a wind float was deployed off the coast of Aguçadoura, northern Portugal, in October 2011. Available at: http://www.principlepowerinc.com/products/windfloat.html; accessed 8 April 2015.

82 For a map of oil exploration concessions off the Portuguese coast, see Galp Energia webpage, available at http://www.galpenergia.com/EN/agalpenergia/Os-nossos-negocios/Presenca-no-mundo/Portugal/Paginas/Exploracao-desenvolvimento-Portugal.aspx; accessed 8 April 2015.

Azores archipelago (projected),[83] and offshore aquaculture,[84] seem to be some of the economic drivers behind the Decree.

This palpable prospect of economic gain resulting from ocean exploitation, especially in the framework of the current economic crisis, when seen in conjunction with provisions put forward in the Decree, raises concerns about the possibility of a gold rush on the Portuguese maritime space. One example is the exemption from payment of the private use fee of the NMS (TUEM) for the exploration and exploitation of geological and energy resources.[85] Another example is the possibility of existing Marine Protected Areas (MPAs) created by the regional governments being excluded from the new MSP plans, if the national government determines that there is a need to safeguard national interests. Although the meaning of "national interest" is not clarified in the Decree,[86] the expectation of net annual revenues in the order of €60 billion (10^9) from seabed mining on the seamounts around the Azores archipelago,[87] where several MPAs are established,[88] may be interpreted as such.[89]

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83 Interest from Nautilus Minerals, a Canadian company, in mining for polymetallic nodules in areas bordering hydrothermal vent fields. MC Ribeiro, 'Case Study from Portugal: emerging deep sea mining interests vs. hydrothermal vents'. Oral presentation given at the Workshop on Limits to Blue Growth in the Deep Sea, organized by WWF and ISRIM during the European Maritime Day, in Bremen, 19 May 2014. Available at: https://www.youtube.com/watch?v=IU5epKf9wiA; accessed 8 April 2015.

84 This is a major focus of the Decree-Law 38/2015 (n 9).

85 Given the stated purpose of the TUEM, which includes anticipating the environmental costs of activities liable to cause significant impact, and the environmental risks posed by sea-bed mining and offshore oil drilling, such an exemption is a troubling sign of private interests prevailing over the public interest, given their potential for environmental degradation.

86 Seminar report (n 19). In the U.S., for example, the definition is very narrow, and includes national security.

87 APEDA, 'Canadianos com luz verde para explorar mina no fundo do mar dos Açores.' 2012. Available at: http://www.pescazores.com/noticias/regionais/canadianos-com-luz-verde-para-explorar-mina-no-fundo-do-mar-dos-acores/; accessed 21 January 2015.

88 OSPAR Commission, *2012 Status Report on the OSPAR Network of Marine Protected Areas* (2013). Online at: http://www.ospar.org/documents/dbase/publications/p00618/p00618_2012_mpa_status%20report.pdf; accessed 21 January 2015. Also see MC Ribeiro, 'The 'Rainbow': The First National Marine Protected Area Proposed under the High Seas' (2010) 25 *International Journal of Marine and Coastal Law* 183–207; *idem*, "Marine Protected Areas: the case of the extended continental shelf", in MC Ribeiro (ed), *30 Years after the Signature of the United Nations Convention on the Law of the Sea: the Protection of the Environment and the Future of the Law of the Sea* (Coimbra Editora, Coimbra, 2014) 179–207.

89 The European Commission is currently supporting a project entitled "Blue Atlantis—Innovative Mining of Marine Mineral Resources—a European Pilot Mining Test in

The record of pilot projects for MRE in Portugal is already marked by the failure of a wave park, 3 nm offshore of northern Portugal, which was presented as a pioneer project worldwide when it was launched in 2008.[90] Three Pelamis machines were removed from the ocean after only four months in place. Technical problems caused by the harsh oceanic environment were the reason presented for the failure of the project. The Portuguese public electricity company purchased the 77% equity held by the private company to try to save the project.[91] Despite that intervention, the private company later abandoned the project, which was never resumed. As of April 2012, the machines were "abandoned" in a nearby port.[92] This experience in the Portuguese scenario is strikingly similar with experiences in the U.S., and raises identical concerns in terms of the promotion of new activities at all costs, vs. a due consideration and protection of existing uses and a careful and comprehensive evaluation of alternatives, as discussed below.

Protection of Existing Uses

The definition of existing uses/activities provided in the Decree[93] leaves out any activities which are not being developed under a private use title of the NMS. Such a definition excludes an estimated 99% of the fishing activity in

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the Atlantic on Tools, Facilities, Operations and Concepts," which intends to "establish the world's only deep-sea mining test facility (…) in the seafloor around the Azores Archipelago" including "four known fields of hydrothermally active vent fields". One of the 45 partners in this consortium is the Canadian company Nautilus Minerals, which "currently has several such prospecting licenses applications in the Portuguese EEZ surrounding the Azores Islands". EIP on Raw Materials: Innovative Mining of Marine Mineral Resources—A European Pilot Mining Test in the Atlantic on Tools, Facilities, Operations and Concepts. Available at: https://ec.europa.eu/eip/raw-materials/en/content/innovative-mining-marine-mineral-resources-%E2%80%93-european-pilot-mining-test-atlantic-tools; accessed 22 January 2015.

90 R Garcia, 'Portugal vai ser pioneiro a nível mundial no aproveitamento da energia das ondas', *Público*, 23 September, 2008. Available at http://www.publico.pt/ciencia/noticia/portugal-vai-ser-pioneiro-a-nivel-mundial-no-aproveitamento-da-energia-das-ondas-1343696; accessed 7 January 2015; See also 'Pelamis, World's First Commercial Waver Energy Project, Aguçadoura, Portugal. Available at http://www.power-technology.com/projects/pelamis/; accessed 8 April 2015.

91 L Pham, 'Waves start to make ripples in renewable energy world' *The New York Times*, 20 October 2009. Available at http://www.nytimes.com/2009/10/21/business/global/21iht-renwave.html?pagewanted=all&_r=0; accessed 8 April 2015.

92 'Ondas de milhões abandonadas', Correio da Manhã, 26 April 2012. Available at: http://www.cmjornal.xl.pt/nacional/economia/detalhe/ondas-de-milhoes-abandonadas.html; accessed 7 January 2015.

93 Decree-Law 38/2015, Article 9(3).

Portugal,[94] an important component of the maritime sector.[95] It also excludes all other existing uses which do not require a private use title. Such an option disregards guidance from the EU MSP Directive on the due consideration that should be given to ongoing uses and activities, including fishing areas.[96] It also disregards the POEM, now considered as the reference situation, which included fishing areas.[97]

As to existing jobs and activities, it is unclear how they will be preserved, if at all. The U.S. experience suggests that a focus on job creation,[98] rather than on maintaining jobs keeping local and regional economies going, may endanger the livelihoods of coastal communities, and promote conflict instead of advantageous coexistence of uses.

The U.S. experience also shows that existing uses are not limited to fisheries and their related activities. They include non-consumptive uses which can be directly linked to various facets of the tourism sector, a huge driver of the Portuguese economy. In 2013, the direct influence of travel and tourism alone represented 5.8% of the Portuguese GDP, in comparison to 3.3% of total GDP in the EU, and approximately 2.9% of global GDP.[99] The ocean is crucial to most if not all ten strategic tourism products recognized by the national tourism agency for Portugal, as a premier coastal nation.[100] These tourism products, which include sea and sun, nature and nautical tourism (e.g., surfing, boating, cruises), eco-resorts, health and well-being, cultural and landscape touring, etc.,[101] rely, to a great extent, on the value of the landscapes (seascapes) and of other ecosystem services.

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94 Seminar Report (n 19) at p. 14.

95 Calado and Bentz (n 57).

96 MSP Directive, Article 8.

97 POEM—Plano de Ordenamento do Espaço Marítimo. 2011. Available at http://www.dgpm.mam.gov.pt/Pages/POEM_PlanoDeOrdenamentoDoEspacoMarinho.aspx; accessed 23 January 2015.

98 Eventually based on technologies which are yet to be fully developed, as the pilot project for wave energy off the Portuguese coast demonstrated.

99 World Travel & Tourism Council, *Economic Impact Analysis* (2014). Available at: http://www.wttc.org/focus/research-for-action/economic-impact-analysis/; accessed 8 January 2015.

100 F Andrade, H Cabral, and M Borges, 'Ambientes costeiros', in HM Pereira, T Domingos, L Vicente, and V Proença (eds), *Ecossistemas e bem-estar humano: Avaliação para Portugal do Millenium Ecosystem Assessment* (Escolar Editora, Lisbon, 2009) 413–435.

101 Plano Nacional Estratégico do Turismo—Proposta para revisão no horizonte 2015—versão 2.0 (National Strategic Plan for Tourism—Revision proposal for 2015 horizon—vs. 2.0). Ministério da Economia, da Inovação e do Desenvolvimento. 2011. Lisbon.

Full Cost-Benefit Analysis of Alternatives

Spatial planning of public assets, such as the ocean, involves political choices targeting the best overall welfare for society. Because space and resources are limited, increased use or protection of any one resource or ecosystem service (natural capital) implies a decreased use of another, with implications for the corresponding users. A trade-off analysis is important in any comprehensive, full cost-benefit analysis (CBA) of alternatives. Such a comparison is often not obvious. Whereas some of the alternatives (and their associated benefits and costs) have a clear and well-established financial/market value, others do not. For natural capital with non-market value it is important to try to quantify benefits for society (for example, see Stanford University's InVEST—integrated valuation of ecosystem services and tradeoffs—a tool developed by the Natural Capital project).[102] Perhaps more importantly, it is necessary to account for the costs that different alternatives impose on different users when the natural capital is disrupted—i.e., the burden on society, including future generations. The U.S. experience shows that comprehensive CBA should consider a full economic evaluation of proposed projects, including maintenance, removal and restoration costs. Such estimates should be independently verified, and include an assessment of displacement costs of existing uses (due to the installation of fixed structures), of the risk of regional job loss, and of the distribution of revenues (not only private vs. public benefit).

Failure to adequately consider the intrinsic value of the ocean in an analysis of alternatives in the framework of strategic MSP imposes serious consequences for its sustainability. An effective CBA should include an analysis of affected natural capital. One example, among the plethora of ecosystem services currently recognized,[103] is the scenic value of an undisturbed seascape—the visual beauty of the unencumbered ocean. Such an asset, highly valued both by people at sea and on the coast,[104] may or may not have a market value attached to it (e.g., beach-front property is worth considerably more than

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Available at http://www.turismodeportugal.pt/Portugu%C3%AAs/turismodeportugal/Documents/PENT_Revis%C3%A30.pdf; accessed 8 January 2015.

102 InVEST, Integrated Valuation of Ecosystem Services and Tradeoffs, 2015. Available for free download from the Natural Capital Project. Available at http://www.naturalcapitalproject.org; accessed on 7 February 2015.

103 E.g., C Liquete, C Piroddi, EG Drakou, L Gurney S Katsanevakis, A Charef and B Egoh, 'Current Status and Future Prospects for the Assessment of Marine and Coastal Ecosystem Services: A Systematic Review' (2013) 8(7) *PLoS ONE* e67737.

104 As an example, the protection of viewsheds is explicitly included in Oregon's MSP, in the form of "Visual Resource Protection Standards" Oregon Territorial Sea Plan Part Five (n 64).

property with no sea view). Even when it does not have a market value, the disruption of the seascape (e.g., by the presence of a structure at sea clearly visible from land), considerably lowers its value (e.g., recreational users will choose other destinations for their activities). Even if these aspects are starting to be studied in Portugal,[105] they are usually not included in a full CBA of alternatives, and users (and society at large) only realize their true value once it is lost.

Although private financial profit may be easier to quantify than public (societal) gain, a full CBA of alternatives must be carried out in planning, allowing decision-makers, if not to quantify, at least to compare and understand the public ocean values and benefits at play. Evaluating the cost of damage to public values (in the short and long term) posed by each development alternative will allow decision makers to promote transparency and fairness in MSP processes, attributes owed by the governing to the governed. A growing set of economic tools is becoming available to aid in such trade-off analyses.[106] As a promising sign, the NOS 2013–2020 includes one project where ecosystem services are integrated into public policies for the ocean, based on and related to the TEEB (The Economics of Ecosystems and Biodiversity) approach.[107]

Such an analysis must be conscientiously carried out through the SEA of the Portuguese marine spatial plans.[108] SEA includes mandatory, detailed strategic and prospective planning, which is at the core of MSP theory and best practices.[109] Despite the extremely short time frame allotted in the Decree for the development of the situation plan (six months from its publication), it is important that the SEA of the situation plan is more than the re-publication of

105 E.g., SF Silva and JC Ferreira, 'The social and economic value of waves: an analysis of Costa da Caparica, Portugal' (2014) 102A *Ocean & Coastal Management* 58–64.

106 E.g., PA Champ, KJ Boyle and TC Brown (eds), *A Primer on Non-Market Valuation: The Economics of Non-Market Goods and Resources* (Kluwer Academic Publishers, Dordrecht, 2003); The Economics of Ecosystems and Biodiversity (TEEB), Y Beaudoin and L Pendleton (eds), *Why Value the Oceans—A discussion paper*, 2012. Available at: http://www.teebweb.org/media/2013/10/2013-Why-Value-the-Oceans-Discussion-Paper.pdf; accessed 9 February 2015.

107 See P Sukhdev, H Wittmer, and D Miller, 'The Economics of Ecosystems and Biodiversity (TEEB): Challenges and Responses', in D Helm and C Hepburn (eds), *Nature in the Balance: The Economics of Biodiversity* (Oxford University Press, Oxford, 2014). Available at http://www.teebweb.org/; accessed 9 February 2015.

108 Both the situation plan and the allocation plans, as defined, meet the requirements of an SEA: they are directly related to the promotion of sustainable development and likely to have significant environmental effects.

109 Ehler and Douvere, 2009 (n 6) at p. 18.

POEM's SEA, a study which is now four years old and was conducted in a different socio-economic and legal context.

A Gold Rush on the Portuguese Maritime Space or Pandora's Box?

Portugal is currently faced with a tremendous challenge: planning, managing, and enforcement of a huge maritime area to promote sustainable marine use and protection. European Union law requires Portugal to attain and maintain GES of its marine waters by 2020; the NOS 2013–2020, the MSPM Law and the Decree all incorporate the obligation. However, environmental concerns are always presented as subsidiary to economic growth.[110] It is interesting that this seems to be the opposite approach to the one stated in the U.S. NOP, which prioritizes "the protection, maintenance, and restoration of the health of ocean (and) coastal (. . .), ecosystems and resources" before the enhancement of "the sustainability of ocean and coastal economies".[111] While there is no assurance that the latter approach will be closer to delivering sustainable ocean management than the former,[112] a focus on exploitation raises concerns that the ocean is being perceived as a last frontier to be exploited, with a potential consequence being the (irreversible) environmental damage that such exploitation may bring about.

Norse[113] eloquently discussed and theorized about the concept of frontier as applied to the ocean,[114] and proposed that "one reason that countless indicators of marine 'health' are declining is the still-widespread belief that the sea is an inexhaustible cornucopia".[115] This view is still promoted by many marine industries[116] and is reflected in the words of the Portuguese minister of the

110 Frazão Santos *et al.*, 2014 (n 57) at p. 51.

111 White House (n 63) at p. 1.

112 Frazão Santos *et al.*, 2014 (n 10) at p. 64.

113 EA Norse, 'Ending the Range Wars on the Last Frontier: Zoning the Sea', in EA Norse and LB Crowder (eds), *Marine Conservation Biology: The Science of Maintaining the Sea's Biodiversity*, Ch. 25, (Island Press, Washington, DC, 2007) 422–444.

114 However, the ocean is no longer the last frontier, as it is already "colonized"—a "peopled seascape". JM Shakeroff, EL Hazen and LB Crowder, 'Oceans as Peopled Seascapes', in K McLeod and H Leslie (eds), *Ecosystem-Based Management for the Oceans* (Island Press, Washington, DC, 2009) 33–54.

115 Norse (n 113) at p. 423.

116 As an example, at a Sea Forum in Porto (Portugal), one promoter of seabed mining concluded his presentation stating that "the next 'pot of gold' at the end of the rainbow may be on the sea floor". This may be seen as a direct allusion to the Rainbow hydrothermal

sea, who, at a 2013 conference, referred to the "Portuguese sea" as a "treasure chest". Such a notion of the potential unlocking of vast resources in Portugal's ocean waters and underlying seabed, in the wider context of the worldwide economic crisis, so severely felt in Portugal, may bring about a gold rush on the Portuguese maritime space.

Contrary to the stated objective of the Portuguese MSPM law, the Decree arguably has the potential to promote (rather than prevent) conflict in the planning and management of the Portuguese national maritime space, through a "race to the bottom". Unbridled access to the ocean commons treasure chest could result in a disastrous outcome more akin to opening Pandora's Box than to a universal boon.

A clear understanding of MSP drivers, an adequate consideration and protection of existing ocean and coastal uses, and a comprehensive strategic evaluation of development alternatives, are crucial to prevent conflicts in the Portuguese maritime space and to ensure its sustainable planning and use. Given its unique geostrategic position and size, the Portuguese approach to this and other challenges (land-sea interaction, EIA for novel activities, transparency, participation, etc.) in its MSP legal framework "might even make history".[117] Implementation will tell whether it becomes an example to follow or an approach to avoid.

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Contributions towards maritime spatial planning (MSP) in Portugal – Conference report

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ABSTRACT

This contribution summarizes the main concerns presented by experts at a conference held in Lisbon in January 2015 to discuss the developing Portuguese legal framework for MSP and lists the suggestions that were correspondingly offered on how to improve the proposed framework.

1. Introduction

On 16 January 2015, an expert conference took place at FCSH/UNL to discuss the current Portuguese MSP legal framework: the Law establishing the Basis of the Policy for Marine Spatial Planning and Management (MSPM) of the National Maritime Space (NMS) (henceforth MSPM Law) [1] (Table 1), and a Decree-Law Proposal (henceforth Proposal) developing the implementation of the MSPM Law and transposing EU's MSP Directive [2] (cf. Supplementary Material, Table S1, with highlights of the Proposal).

The conference had a double objective: (i) to discuss the Portuguese MSP legal framework, particularly the Proposal and (ii) to produce a document to be sent to the government with suggestions for improvement. The conference was organized in three sessions (spatial planning, law, and environment) with specialists in themes related to MSPM from academia and civil society as invited speakers.

2. Conference report

Table 2 summarizes the main concerns raised by experts during the conference, focusing on the following themes: (i) option for national development model; (ii) articulation with the terrestrial planning and management system; (iii) management principles in the relation between the central government and the Autonomous Regions; (iv) approach to international best practices for environmental sustainability (including ecosystem-based management, stakeholder engagement, strategic environmental assessment, monitoring and evaluation, and international commitments); (v) equity in treatment of uses and activities; (vi) clarity of decision criteria for conflict resolution; and (vii) general aspects related to the Proposal and to its development process.

To every critique or concern raised at the conference, concrete suggestions for its resolution or clarification were proposed. Table 2 is organized to highlight the clear connection between concerns raised and the corresponding suggestions, showing that no concern was left unaddressed.

3. Conference conclusions

The Portuguese government's merit and effort to regulate such an important and complex matter as MSPM of its Maritime Space was generally acknowledged. However, the main message from the conference discussion is that both the Proposal and its development process have been unnecessarily opaque and may promote, rather than avoid, conflict, suspicion, legal uncertainty and waste of time. They lack a solid legal framework and the necessary societal consensus. It is vital to improve the current

Table 1
MSPM Law (highlights).

Theme	Description
Principles, Art. 3.	Ecosystem approach, adaptive management, integrated management, valorization and promotion of economic activities, regional and cross-border cooperation and coordination
Objectives, Art. 4(1).	Promotion of economic exploitation, [one which is] sustainable, rational and efficient, of marine resources and ecosystem services, ensuring the compatibility and sustainability of the diverse uses and of the activities developed therein, considering the inter and intra-generational responsibility in the use of the national maritime space and aiming at job creation
MSPM system, Art. 6.	Strategic instrument of MSPM policy: National Ocean Strategy (NOS 2013-2020) MSP instruments for the national maritime space
MSP instruments, Art. 7(1)	Situation plan and Allocation plans
Information and participation rights, Art. 12.	(1) All those interested have the right to be informed and to participate in the processes of elaboration, amendment, revision and suspension of the instruments for the spatial planning of the national maritime space, namely by electronic means. (2e) The participation of those interested through the process of public discussion

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Table 2
Synthesis of main concerns and corresponding suggestions for improving the proposed framework.

Theme	Concerns	Suggestions
Development model	– The current legal framework is inspired by EU's Blue Growth development model, ignoring sustainable development as a vision. It uses MSP solely as a licensing tool instead of a basis for social, environmental and economic development. – It is unclear how the economic revenue from private use of the sea including the private use fee (TUEM) will revert to public benefit.	– Clarify the MSP policy of the NMS, namely vision, goals and objectives in the context of sustainable development taking into account the ecosystem approach (instead of just as a licensing regime). – Allocate part of TUEM's revenue to an Ocean fund to stimulate national-based entrepreneurship and innovation for marine industries, and to invest on science and the long-term protection and conservation of the marine environment.
"One country, two systems"	– The proposed MSPM system (Situation and Allocation Plans) is not an articulated system: – It is disconnected from the coastal and terrestrial planning systems, lacking clarification on their interlinkages, and hierarchical relationships, statutory effects, criteria for approval/refusal, scope, typology, and material and documental contents of such instruments; – The possibility of lower ranking allocation plans amending hierarchically superior plans reverses well-established best practices of planning instruments. – The proposed MSPM instruments are unsuitable for planning: – The Situation plan is merely a representation of current and potential uses, proposing no programmes or strategies; – Allocation plans are pathways for the promotion of private interests, allocating ad-hoc patchworks of private pretensions of sea uses at the expense of integrated public planning.	– Restructure the architecture and conceptual framework of the Portuguese MSPM system namely in what concerns spatial planning instruments. – Modify terminology: "Situation Plan", should be changed to "Map of existing and potential situation"; "Allocation Plans", when resulting from private initiative, to "Licensing Process for uses and activities". – Public and private investment should be directed to the Situation Plan, to enhance knowledge on existing activities and resources and the impacts and pressures they are subjected to.
Shared management with the Autonomous Regions (ARs)	– Several norms in the Proposal are deemed unconstitutional and illegal because they overlook constitutional and statutory principles, such as cooperation and shared management between central government and the ARs, as well as specific competencies of the ARs in relation to sea affairs. The ARs can plan their maritime space, namely through the creation of MPAs and may license certain maritime uses and activities.	– Clarify the concept of shared management and its domains of application in conformity with the Portuguese Constitution and the Political–Administrative statutes of the ARs.
International best practices for environmental sustainability	– Ecosystem-based management (EBM) is generically advocated in the legal framework but is not applied (no specific norms for achieving it). – Stakeholder engagement in managing the commons: An innovative model of active stakeholder engagement is advocated, in line with European and international law and principles. However, actual participation opportunities in the proposal follow traditional models of participation (e.g. public scrutiny only at the final stages of the process) with low levels of engagement. – Strategic Environmental Assessment (SEA): The proposal states that the Situation Plan may be exempted from SEA, required under EU and national law. Conversely, the proposal parallels Allocation Plans to projects, subject to Environmental Impact Assessments (EIA). However, the EIA legal framework in Portugal is not designed for the reality of the marine environment. It is unlikely that an Allocation Plan will include the elements necessary to identify and evaluate the corresponding environmental impacts, therefore increasing the risk of promoting unreliable evaluations. – Monitoring and evaluation: Monitoring the implementation and development of licensed activities, increasing knowledge on the environment and their potential impacts is vital. The operational details of the monitoring obligations of private users and the process of institutional interaction during the evaluation stages are vague, laconic or inexistent, in particular in relation to the mechanisms for collection, transmission, validation and evaluation of data and information. – International commitments: The possibility to automatically revoke instruments adopted in the framework of national and international commitments (e.g., MPAs), under dubious concepts such as "national interest", impairs the sustainable use and conservation goals which have been implemented during the last decades.	– Adopt provisions for an effective EBM, including fisheries (e.g. consider the spatialization of fishing opportunities). – Introduce effective/meaningful participation mechanisms, from the earliest stages of the planning process, ensuring co-construction of a model of collaborative governance, articulating multiple institutional/societal layers and promoting shared responsibility. – Stipulate mandatory SEA of the Situation Plan and Allocation Plans to ensure sustainability of proposed options. – Promote monitoring and evaluation of environmental status: require the collaboration of private users in the provision of access, installation of platforms of opportunity and collection of data during exploitation; guarantee data availability to estimate all new sources of anthropogenic mortality to traditional fishery resources and extend the evaluation of acceptable exploitation level to new resources (e.g. marine taxa relevant for biotechnology); clarify the role of private users and public institutions in the evaluation stage. – Remove the provision that allows revoking protective measures of resources and the environment on grounds of "national interest".
Differential treatment of uses and activities	– Existing uses, namely fisheries (a traditional and socially important activity in Portugal), are not given equal treatment compared to potential emerging uses. – Exemption of payment of TUEM by activities related to the "exploration and exploitation of geologic and energy resources" is environmentally incomprehensible and socially and economically unfair (TUEM is intended to compensate for the environmental costs of the activities).	– Integrate fisheries and other existing (including non-consumptive) uses in the planning process in an equitable way. – Introduce a framework for co-management and shared responsibility in resource management, including, but not limited to, fisheries. – Remove the exemption of certain activities from TUEM, which should be higher for the most profitable (and most environmentally hazardous) activities.

Table 2 (*continued*)

Theme	Concerns	Suggestions
Decision criteria for conflict resolution	– Geared to the evaluation of social and economic advantages, and based on vague, unreliable and undefined indicators. This may generate practical problems, hindering the implementation of the legal framework. Also, the mechanism (and associated public costs) of relocating existing uses and activities may harm public interests and goals.	– Identify and use coherent and clear criteria for conflict resolution among competing uses or activities.
	– Unrealistic response deadlines by the administration may lead to undesirable tacit approvals.	– Allot realistic response deadlines to allow for responses in a timely and professional/responsible manner.
Proposal's development process and general aspects	– It is unclear why the proposal's development process was not subjected to extensive public discussion, mandated by the transparency and participation principles, pillars of the Portuguese democracy.	– Subject the proposal to further meaningful discussion with a broad range of stakeholders prior to its implementation.
	– Dubious/vague concepts and criteria.	– Clarify the wording of the proposal. – Make sure the current policy is coherent with the main responsibilities of a maritime country such as Portugal under national and international law and mechanisms.

legal framework, namely in terms of the proposed system's actual capacity to promote the public interest, and to improve its clarity and its capacity to ensure the sustainability of future planning and management actions. This is why, for every concern, suggestions were offered on how to improve the proposed framework. A conference report detailing all of the aspects summarized herein was sent to the Portuguese authorities on 30 January 2015 [3].

The Proposal was officially published, virtually unchanged, on 12 March 2015 (Decree-Law 38/2015) [4]. Voices in the National Parliament have already demanded its further discussion. The organizers of the conference remain fully available to collaborate with the law-making authorities to improve the current legal framework for the spatial planning and management of the Portuguese National Maritime Space.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.marpol.2015.04.017.

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X CONGRESSO DA GEOGRAFIA PORTUGUESA
Os Valores da Geografia
Lisboa, 9 a 12 de setembro de 2015

O Mar Português como uma Arca dos Tesouros?

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Resumo

O quadro legal para o ordenamento e gestão do Mar Português, um dos maiores da União Europeia (UE) e do mundo, inclui a Estratégia Nacional para o Mar 2013-2020 (baseada no "Crescimento Azul" da UE), a Lei de Bases da Política de Ordenamento e Gestão do Espaço Marítimo Nacional (LBOGEM) e o Decreto-Lei que desenvolve aspectos da LBOGEM e que transpõe a Directiva Europeia do Ordenamento do Espaço Marítimo.

Este quadro legal parece dominado por uma visão economicista, de exploração dos recursos e promoção de novas actividades no Mar Português – que foi nomeado publicamente pela tutela como "Arca dos Tesouros". Porém, sem adequadas salvaguardas ambientais e consideração pelos usos existentes – e as suas componentes humana e social – este quadro pode fazer perigar os objectivos de inclusividade e resiliência do Portugal 2020, inserido na Estratégia Europa 2020.

Defende-se que uma visão holística, com a participação de todos os agentes, é fundamental para que o Mar Português possa ser abordado de uma forma socialmente justa e verdadeiramente sustentável.

Palavras chave: ordenamento e gestão do espaço marítimo; protecção de usos existentes; exploração de recursos finitos; sustentabilidade; participação efectiva dos interessados.

1. Introdução

Com uma área marítima de quase 4 milhões de km^2, Portugal é uma das maiores nações marítimas a nível mundial. O Espaço Marítimo Nacional (EMN), incluindo o leito marinho, é potencialmente rico em recursos vivos e não vivos e há um interesse crescente na sua exploração, que tem vindo a ser manifestado por diversos agentes relativamente à exploração de energias renováveis, includindo energia das ondas e energia eólica, extracção de petróleo, exploração de nódulos polimetálicos nos fundos marinhos e aquacultura *offshore* (Ferreira *et al*., 2015c).

Portugal tem vindo a definir nos últimos anos uma visão para o futuro do seu espaço marítimo, tendo construído, desde 2014, todo um novo quadro legal para o Mar Português em linha com as políticas marítimas desenvolvidas a nível da União Europeia durante a última década, de que se destacam a Estratégia de Crescimento Azul (COM(2012) 494 final, 2012), entendida como o braço marítimo da Estratégia EUROPA 2020, e a recente Directiva para o Ordenamento do Espaço Marítimo (OEM) (Directiva 2014/89/UE, 2014). Porém, o quadro legal nacional para o mar parece dominado por uma

visão economicista (Ferreira *et al*., 2015a), de exploração dos recursos e promoção de novas actividades no Mar Português – já apelidado publicamente pela tutela de "Arca dos Tesouros" (Ferreira *et al*., 2015c). Porém, sem adequadas salvaguardas ambientais e consideração pelos usos existentes – e as suas componentes humana e social – a "Arca dos Tesouros" pode transformar-se numa "Caixa de Pandora", fazendo perigar os objectivos de inclusividade e resiliência do Portugal 2020, inserido na Estratégia Europa 2020.

Neste contributo, apresenta-se brevemente o quadro legal nacional relativo ao ordenamento do Espaço Marítimo em Portugal, salientando-se algumas preocupações que dele decorrem e uma proposta para que o Mar Português possa ser abordado de uma forma socialmente justa e verdadeiramente sustentável.

2. O estado do Ordenamento do Espaço Marítimo em Portugal

O Ordenamento do Espaço Marítimo (OEM) é definido, a nível europeu, como "um processo através do qual as autoridades competentes dos Estados-Membros analisam e organizam as actividades humanas nas zonas marinhas para alcançar objectivos ecológicos, económicos e sociais" (Directiva OEM, 2014, p. L257/140).

A Estratégia Nacional para o Mar 2006-2016 (ENM 2006-2016) definiu como um dos seus pilares estratégicos, o "ordenamento e planeamento espacial do espaço oceânico e zonas costeiras" (RCM, 2006, p. 8325). O primeiro plano de OEM nacional, para a Zona Económica Exclusiva (ZEE) do continente, o POEM, desenvolvido ao longo de três anos por uma equipa multidisciplinar, acabou por ser publicado, apenas como um estudo, em 2012 (Despacho n.º 14449/2012).

Com um crescente enquadramento europeu para as questões marítimas, o governo português antecipou a revisão da ENM 2006-2016 e publicou, em Fevereiro de 2014, a Estratégia Nacional para o Mar 2013-2020 (ENM 2013-2020, RCM nº 12/2014), que adoptou o "crescimento azul" como modelo de desenvolvimento e que, ao contrário da sua antecessora, inclui um plano de acção, o Plano Mar-Portugal (PMP).

Em Abril de 2014, foi publicada a Lei de Bases da Política de Ordenamento e Gestão do Espaço Marítimo Nacional (LBOGEM) (Lei nº 17/2014), que define como objectivo primeiro do quadro legal de ordenamento e gestão do EMN, "a promoção da exploração económica sustentável, racional e eficiente dos recursos marinhos e dos serviços dos ecossistemas, garantindo a compatibilidade e a sustentabilidade dos diversos usos e das actividades nele desenvolvidos, atendendo à responsabilidade inter e intrageracional na utilização do espaço marítimo nacional e visando a criação de emprego" (*ibid*., p. 2358). A LBOGEM estipula ainda que o ordenamento e gestão do EMN devem"prevenir ou minimizar eventuais conflitos entre usos e actividades desenvolvidas no EMN" (*ibid*., p. 2359). Vários aspectos da LBOGEM foram detalhados pelo Decreto-Lei 38/2015, que transpôs também para o quadro jurídico nacional a Directiva Europeia para o OEM publicada em 2014.

3. Questões levantadas pelo presente quadro legal para o ordenamento e gestão do EMN

Embora a LBOGEM articule, expressamente, o objectivo de compatibilidade dos diversos usos e actividades desenvolvidas no EMN, o Decreto-Lei que a desenvolve define "usos e actividades existentes" como "aqueles que estão a ser desenvolvidos ao abrigo de um título de utilização privativa" do EMN, excluindo do exercício de OEM todas as outras actividades que não requeiram um título de utilização privativa, como o lazer, nas suas várias vertentes, e actividades como a navegação ou a pesca. Além de contrariar orientações da Directiva Europeia para o OEM (p. ex., no caso da pesca), esta exclusão pode contribuir para complicar/dificultar a prossecução do objectivo de compatibilização de actividades.

Em caso de conflito potencial entre usos ou actividades, o Decreto-Lei define dois critérios de preferência, desde que assegurada a protecção dos valores ambientais: i) maior vantagem social e económica para o país; e ii) máxima coexistência de usos ou actividades. Este último critério só se aplica quando o primeiro não for aplicável ou quando, da avaliação do primeiro, resultar igualdade à luz dos seguintes parâmetros de avaliação: a) nº de postos de trabalho criados; b) qualificação de recursos humanos, c) volume do investimento; d) viabilidade económica do projecto; e) previsão de resultados; f) contributo para o desenvolvimento sustentável; g) criação de valor; h) sinergias esperadas nas actividades conexas; e i) responsabilidade social dos interessados no desenvolvimento do uso ou actividade. Estes parâmetros para a determinação preferencial de um uso ou actividade privilegiam actividades novas *vs*. actividades existentes (Ferreira *et al*., 2015a, b, c).

O Decreto-Lei cria também uma taxa de utilização privativa do EMN (TUEM) que visa compensar: i) o benefício resultante da utilização privativa; ii) o custo ambiental inerente às actividades susceptíveis de causar impacte significativo no EMN; e iii) os custos administrativos resultantes do ordenamento e gestão, segurança marítima, manutenção e fiscalização (Decreto-Lei, p. 1541). Porém, explicita que a TUEM não se aplica às actividades de "revelação e aproveitamento do recursos geológicos e energéticos" (*ibid*.). Tal isenção, inexplicável, concedida às actividades potencialmente com maior retorno económico e impactes ambientais mais significativos, é potenciadora de desigualdades e de conflito.

Estes três aspectos geram um conjunto de preocupações que podem resultar em ameaças à adequada consecução dos objectivos sócio-ecnómicos do OEM em Portugal:

- cingindo-se o OEM apenas aos casos que requerem título de utilização privativa do EMN, como se enquadram as restantes actividades e as comunidades directa e indirectamente afectadas? Quais os efeitos económicos e sociais de ignorar, entre outras actividades existentes, a pesca e usos não consumptivos/não-extractivos (nomeadamente o turismo e o lazer), que contribuem de forma determinante e sensível para a economia e a manutenção das comunidades locais (Ferreira *et al*., 2015c)?

- importa também relevar a dicotomia "uso privativo" *vs*. "uso exclusivo", sendo que é este último que potencia e determina conflito, precisamente pelo seu carácter de exclusividade;

- em termos de solidariedade social, como compreender a isenção de TUEM para as actividades potencialmente com maior retorno económico privado obtido a partir do bem público e maior risco para este?

- como conciliar o objectivo de antecipar e resolver conflitos, com uma potencial geração de situações de desigualdade e exclusão social?

4. A importância da participação

Com um quadro legal dirigido à promoção de novos usos económicos do EMN, é fundamental a participação proactiva de todos os agentes interessados, que ajude a conduzir a sua implementação rumo à consecução equilibrada dos objectivos ecológicos, económicos e sociais do OEM nacional. A LBOGEM estabelece o direito de participação de "todos os interessados (...) nos procedimentos de elaboração, alteração, revisão e suspensão dos instrumentos de ordenamento" do EMN (Plano de Situação e Planos de Afectação) (LBOGEM, p. 2360) e o Decreto-Lei esclarece que este direito "compreende a possibilidade de formulação de sugestões e pedidos de esclarecimento" ao longo dos vários procedimentos referidos (elaboração, alteração, revisão e suspensão) "bem como a intervenção na fase de discussão pública" (Decreto-Lei nº 38/2015, p. 1527).

Há contextos adicionais para essa participação no quadro da avaliação ambiental que deverá estar associada à elaboração dos futuros planos de ordenamento do EMN: a Avaliação Ambiental Estratégica (AAE) do Plano de Situação; e os Estudos de Impacte Ambiental (EIA) dos Planos de Afectação.

O Decreto-Lei consagra ainda a participação dos interessados, na avaliação permanente dos instrumentos de OEM e na discussão pública dos relatórios sobre o estado do OEM nacional que deverão ser produzidos trianualmente.

Esta participação continuada ao longo de todo o processo é o maior garante de *inclusividade* e de *representatividade* dos actores/agentes em causa, permitindo um equilíbrio a nível da contribuição e ponderação dos interesses em jogo, tradicionalmente enviesada a favor dos actores com maior peso económico. A participação, ao trazer à mesa, desde o início, todos os agentes e os seus interesses, configura-se como ferramenta essencial para assegurar os objectivos de coesão social e de minimização de conflito.

Este é, porém, um enorme desafio à (reduzida) prática de participação em Portugal, quer da parte dos cidadãos, quer das próprias autoridades, pouco familiarizados com os processos participatórios (cf., p.ex. Schmidt *et al*., 2013, 2014). Neste contexto, a comunidade científica/académica tem um papel único e fundamental, por três ordens principais de razões: i) o seu papel na formação das próximas

gerações (de onde sairão os futuros governantes); ii) o dever de partilhar o seu conhecimento científico, base fundamental para uma correcta gestão, obtido, frequentemente, por investigação suportada por fundos públicos nacionais; e iii) a idoneidade e independência reconhecida pelos restantes agentes, públicos, privados, ou da sociedade civil. Neste quadro, a comunidade científica/académica, entre outras iniciativas, pode e deve promover oportunidades de debate/discussão, contribuindo para alargar o número de agentes informados e envolvidos. A título de exemplo, pode citar-se o Debate sobre o Mar Português promovido pela FCSH, cujas conclusões foram partilhadas com a tutela previamente à publicação do Decreto-Lei (Ferreira *et al*., 2015a, b).

5. Conclusões: Arca dos Tesouros ou Caixa de Pandora?

O actual quadro legal para o ordenamento e gestão do Espaço Marítimo Nacional, que abrange 97% do total do território Português, promove/favorece os novos usos face aos usos existentes e tem potencial para gerar, ao invés de evitar, conflitos na gestão deste espaço, gorando assim a consecução dos objectivos ecológicos, sociais e económicos do OEM. A abertura a alguns privados, do acesso aos comuns oceânicos, sem assegurar devidamente contrapartidas ambientais, sociais e económicas pode, ao invés de revelar uma Arca dos Tesouros, abrir uma Caixa de Pandora, com consequências imprevisíveis.

Embora este quadro legal esteja em grande parte "fechado", há ainda mecanismos que permitem afinar/melhorar o sistema em vigor. A LBOGEM adoptou o princípio da gestão adaptativa, proposto em 1999 como um de seis princípios chave para a gestão sustentável do Oceano (Costanza *et al*., 1999). Os relatórios trianuais previstos, abrem espaço para uma revisão periódica do quadro legal, que permita o seu melhoramento efectivo. Também noutros momentos de participação previstos no quadro legal, é possível contribuir para a implementação e sucesso do OEM nacional. Para tal é, no entanto, imperioso promover uma participação proactiva do maior número possível de agentes relevantes, por forma a potenciar a utilização sustentável, equitativa e socialmente inclusiva do EMN. Neste processo, a comunidade científica/académica tem um papel único e incontornável a desempenhar.

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Measuring Success of Ocean Governance: a Set of Indicators from Portugal

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ABSTRACT

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Evaluating the success of marine spatial planning (MSP) remains a challenging task. Portugal, one of the world's largest maritime nations, with its recent ocean governance framework, is an ideal case study for the development of an evaluation mechanism for MSP. This paper presents a brief characterization of Portugal's maritime area and of its legal regime, and a methodology for defining and selecting a set of indicators to evaluate MSP once it has been operational for a number of years. The resulting set of indicators is discussed, as are prospects for their development and generalization.

ADDITIONAL INDEX WORDS: *Maritime spatial planning, Portugal, indicators.*

INTRODUCTION

Ocean governance frameworks, including marine spatial planning (MSP), are increasingly being developed and implemented wordwide (Cicin-Sain *et al.*, 2015; Ehler, 2014). They are prompted by a growing competition for space and resources in this "last frontier" environment – the ocean, seen as a promising new source of opportunities, "an inexhaustible cornucopia" (Norse, 2005, p.423). However, they are also coupled with the recognition that the intensification of maritime activities has the potential to increase conflicting situations, and degrade the marine environment, upon which all of us depend (IOC, 2006). As such, evaluating the success of integrated ocean management initiatives, generally aimed at achieving sustainable use of the marine environment and its resources, is of the utmost importance (Ehler, 2014; IOC, 2006).

Evaluation is often achieved based on sets of indicators, understood as "quantitative/qualitative statements or measured/observed parameters that can be used to describe existing situations and measure changes or trends over time" (IOC, 2006, p. 11). In a management context, indicators should be directly linked to intended objectives (Day, 2008; Douvere and Ehler, 2011). They should also be measurable, interpretable and understandable, sensitive to changes in relevant aspects and responsive to management actions, be based on established scientific theory, and be cost-effective; to be manageable and effective, an ideal set should comprise as few indicators as possible (Douvere and Ehler, 2011; IOC, 2006).

In the context of the evaluation of ocean governance frameworks, and MSP initiatives in particular, indicators should highlight the effects of maritime activities (the focus of MSP), ideally establishing a clear link between a given activity and its impacts (positive and/or negative). Notwithstanding a growing literature on the subject of evaluation of MSP (*e.g.* Carneiro, 2013; Ehler, 2014), it remains a difficult issue to tackle in practice, as the Belgian MSP example, advocating the importance of indicators but proposing none, clearly demonstrates (Royaume de Belgique, 2014).

As one of the world's largest maritime nations, and with its ocean governance framework just finalized, Portugal emerges as an ideal case study for the development of an evaluation mechanism for its marine spatial planning and management (MSPM) system. At the current stage of the ocean governance cycle in Portugal, before any Marine Spatial Plans are in place, what indicators are most suited to evaluate progress towards sustainable ocean governance and can they be beneficially used in other contexts?

This paper presents a brief characterization of Portugal's national maritime space (NMS) and of the corresponding legal regime. It then presents a methodology for defining and selecting a set of indicators to evaluate the implementation of its MSPM system. The set of indicators obtained is briefly presented and discussed, as are prospects for their development and possible application to other contexts.

The Portuguese case

Portugal's maritime area (0-200 nautical miles, nm), including the Exclusive Economic Zones (EEZs) of the mainland and of the archipelagos of Madeira and the Azores totals c. 1 700 000 km^2. Portugal also has sovereign rights over the natural resources of the seabed and subsoil beyond 200 nm (a map of Portugal's maritime area can be found at http://www.emepc.pt/images/pdf/MapaPortugaleMar.pdf). This extended continental shelf adds another 2 100 000 km^2 of ocean seafloor to Portugal's NMS, which totals *c*. 3 800 000 km^2 (*c*. 4% of the Atlantic Ocean and 1% of the global Ocean) (Bessa

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Pacheco, 2013). Portugal's NMS is potentially rich in living and non-living resources (Resolution 12, 2014). In recent years, several private sectors have shown a growing interest, *i.a*., in the exploration and exploitation of renewable energies (including wave and wind), oil and natural gas extraction, massive sulphides on the sea bottom and offshore aquaculture (Ferreira *et al.*, 2015). Non-consumptive uses such as leisure and coastal and nautical tourism, of which surfing is one notable example, are growing activities and key drivers of the Portuguese economy (*ibid*.).

Since 2014, Portugal has been developing the political and legal framework for its NMS, very much aligned with the European Union's (EU) maritime policies:

- February 2014: National Ocean Strategy 2013-2020 (NOS 2013-2020). It adopted "Blue Growth" (COM(2012) 494 final) as its development model, and stated Portugal's strategic objectives for its NMS (Resolution 12, 2014);
- April 2014: Law establishing the Basis of the Policy for Marine Spatial Planning and Management of the NMS (MSPM Law). It stated the objectives of marine spatial planning and management (MSPM) of the NMS, and created two types of marine spatial plans (MSPlans): the Situation Plan for the entire NMS and smaller scale Allocation Plans (Law 17, 2014);
- March 2015: Decree-Law 38/2015 detailing aspects of the implementation of the MSPM Law and transposing the EU's MSP Directive (2014/89/EU of 23 July). It stated the objectives of future Portuguese MSPlans, and defined that until the adoption of the Situation Plan, the POEM (an MSPlan developed in 2008-2010 for the EEZ of mainland Portugal and published as a study in 2012) is to be considered as the reference situation for MSP of the entire NMS and for the allocation of new private use titles (Decree-Law 38, 2015; Ferreira *et al.*, 2015a).

As a contracting party to several international conventions and as a EU member state, Portugal fulfills a number of obligations concerning ocean issues, including the implementation of the monitoring programme for the EU's Marine Strategy Framework Directive (MSFD), which aims to achieve or maintain Good Environmental Status (GES) of the marine environment by 2020 (OJEU, 2008).

METHODS

The Portuguese legal framework for MSPM was analyzed to identify stated objectives of (future) MSPlans, through which the Portuguese MSPM system will be implemented.

A literature review of scientific and technical references on evaluation mechanisms and established indicators of Ocean governance with emphasis on MSP was carried out. It included a search for indicators of sustainable development, evaluation of MSP and MSPlans, and implementation of international conventions and commitments, and European Directives pertinent to maritime issues. Selected indicators were tentatively matched with stated objectives.

A review of ocean monitoring commitments assumed by Portugal was also carried out to identify and take advantage of potential areas of overlap, avoiding duplication of efforts, and minimizing implementation costs.

RESULTS

Decree-Law 38/2015 states the following objectives of future Portuguese MSP instruments (Decree-Law 38, 2015, p. 1526):

a) To implement the objectives of strategic development established in the strategic instruments of the spatial planning and management of the national maritime space, namely in the National Ocean Strategy;

b) To promote the sustainable economic, rational and efficient exploitation of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change;

c) To align (order) the uses and activities to be developed in the national maritime space taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment;

d) To prevent or minimize eventual conflicts among uses and activities developed in the national maritime space;

e) To ensure legal certainty and transparency of the procedures entrusting the rights of private use in the national maritime space;

f) To ensure the use of available information on the national maritime space.

Strategic development objectives stated in the NOS 2013-2020, the object of objective a), are presented in Table 1. The indicators for objective b) are presented in Table 2, and the indicators for objectives c) to f) are presented in Table 3.

International and/or European targets for selected indicators are indicated when available, as are existing monitoring programmes already being conducted by Portugal.

Table 1. *Strategic objectives of the Portuguese NOS2013-2020 and related indicators.*

Objective	Indicator
To reaffirm the national maritime identity in a modern proactive and entrepreneurial framework;	-
To bring to realization the economic, geostrategic and geopolitical potential of the national maritime territory, turning the Mar-Portugal into an asset with permanent economic, social and environmental benefits;	-
To create conditions for attracting investment, both national and international, in all sea economy sectors, promoting growth, employment, social cohesion and territorial integrity, and, until 2020, promoting an increase of the sea economy contribution to the GDP of about 50%.	contribution of the sea economy to the GDP (%)
To strengthen national scientific and technological capacity, stimulating development of new areas of action that promote the knowledge of the Ocean and effectively and sustainably enhance its resources, uses and activities as well as the ecosystem's services.	-
To make Portugal, on a worldwide level, a leading maritime nation and an undisputed partner of the IMP and of the EU maritime strategy in particular for the Atlantic area.	-

Table 2. *Proposed indicators for objective b). References: [1]MAOT, 2010; [2]GRA, 2011; [3]GGKP, 2013; [4]UNGA, 2015; [5]GFCM, 2013; [6]UNEP, 2010; [7]OJEU, 2013; [8]SIC, 2013; [9]SCBD, 2011; [10]Governo de Portugal, 2014; [11]IOC-UNESCO, 2011; [12]UNEP, 2014; [13]IEEP, 2003; [14]EC, 2010; [15]EC, 2011; [16]UNEP, 2006. *Monitoring planned or underway*.

Indicator	Unit
Requests to use the national maritime space[1]	No.
Changes in the use of maritime space[1]	%
Private investment in the national maritime space[1]	€
Public and private investment in RDT by sector of maritime activity[1]	€
Contribution of maritime economic activities in the trade balance[1]	€
GAV by sector of maritime economic activity[1]	€
GDP/*capita* of coastal residents[2*]	€/inh.
Electricity generated from marine renewables[1*]	%, GWh
New market niches explored and product diversification[1]	No./%
Trends in benefits that humans derive from ecosystem services: GAV in the Environmental Goods and services sector[3]	% GDP
Trends in benefits that humans derive from ecosystem services: employment in the Environmental Goods and services sector[3]	% total employment
Sustainability/quality certification schemes (fisheries, aquaculture)[4,5]	%
Green award certification (shipping)	No., %
Stocks at MSY (*Maximum Sustainable Yield*)[6*]	%
Stocks overfished[4]*	%
Unwanted catches& discards /catches landed[7]	%
Tourism figures for wildlife visitor attractions[8*]	No.
Benefit sharing with coastal communities[9]	
Shipping density[10*]	-
Coastal & marine area protected[1*]	%
Degraded ecosystems restored[1]	%
Developments permitted impacting designated sites/species[8]	No.
Condition of Marine Protected Areas[8*]	-
Conservation status of marine mammals[8*]	-
Conservation status of marine birds[8*]	-
Environmental Status of the marine environment[1*]	MSFD
State of coastal and transition waters[1*]	WFD
Trends of invasive alien species[1*]	No.
Escapement of cultured species	No.
Marine trophic index[11]	-
Red List Index[12]	-
Status of target species[13]	-
Food chain impacts[13]	-
Greenhouse Gas emissions from maritime transport[14, 15*]	g/tonkm
Energy efficiency[16*]	-
Specific CO_2 emissions[14*]	g/tonkm
Plastic materials entering ocean[4*]	ton/y
Pollution incidents reported[8]	No.
Incidents of dumping at sea[8]	No.
Applications with waste/litter management plan/measures[8]	No.
Operational pollution from ships[16]	No.
Port waste reception facilities available[12]	%
Noise[10*]	-
People & goods affected by storms	%, No.
Losses from climate related events[11]	€

Table 3. *Proposed indicators for objectives c), d), e), and f). [1]SDSN, 2015; [2]Ehler 2014; [3]SIC, 2013; [4]EC, 2010; [5]MAOT, 2010; [6]Ardron et al., 2014; [7]UNEP, 2014.*

Indicator	Unit
Objective c)	
Marine areas and coastline with formulated &adopted ICM/MSP plans[1]	%
Zoning plans and regulations completed, approved & implemented[2]	%
Applications where there are potential impacts on a site designated for historical environment[3]	No.
Condition of sites designated for historical environment[3]	-
Monitoring & mapping of new historical environment sites discovered as part of a development[3]	%
Employment rate of population aged 20-64[4]	%
Employment rate in maritime sectors[5]	%
Objective d)	
Conflicts in the use of maritime space by type and frequency	No.
Reported navigational accidents as a result of a marine development (construction or operation)[3]	No.
Applications refused due to incompatibility with other marine uses[3]	No.
Applications where there are potential impacts on the marine environment as a result of infrastructure development[3]	No.
Objective e)	
Licenses refused	No.
Conflicting processes at one-stop-shop	No.
Access to data (allowing for peer-reviewing of scientific advice)[6]	% requests
Access to meeting documents[6]	% requests
Rules concerning the participation of civil society observers[6]	-
Access to compliance and performance measures[6]	-
Objective f)	
Existence of a system of annual update	-
Incorporation of knowledge into management plans	-

DISCUSSION

To find indicators for the stated objectives of future Portuguese MSPlans, and to effectively articulate with the implementation of international commitments, such as the United Nation's Sustainable Development Goals (SDGs), particularly Goal 14 related to the conservation and sustainable use of "the oceans, seas, and marine resources" (UNGA, 2015), the present exercise drew information from a diversity of references related to ocean governance, including MSP, and specific maritime sectors.

The identification of potentially useful indicators for the evaluation of future Portuguese MSPM instruments was a challenging task for two main reasons: the general nature of the objectives, and the scarcity of currently available bibliography that comprehensively and effectively tackles the evaluation of MSP and related activities (especially considering the diversity of activities projected to take place in the Portuguese NMS).

Most of the stated objectives, particularly those of the NOS 2013-2020, can be equated to what Douvere and Ehler (2011) designated as "goals", *i.e.*, "statements of intent or general direction" as opposed to "objectives" defined as "statements of

measurable outcome" (*ibid.*, p.309). This vagueness promotes subjectivity in the indicator selection process. To assist in the identification of adequate indicators, objectives should be SMART: Specific, Measurable, Achievable, Relevant, and Time-bound (*e.g.*, Ehler, 2014). However, only one of the stated objectives meets these requirements ("*increase contribution of the sea economy to the GDP of about 50% by 2020*") allowing for a direct derivation of the corresponding indicator (cf. Table 1). The remaining strategic objectives of the NOS were found to be too broad or unclear to derive indicators, an unsurprising consequence of their strategic nature. The same difficulty was also felt with the objectives for MSP instruments, stated in Decree-Law 38/2015, due to their dubious/vague phrasing (Ferreira *et al.*, 2015b).

Related to this aspect is the differential complexity of the various objectives. While some are single and straightforward (*e.g.*, "prevent or minimize conflicts" or "ensure the use of available information"), others (*e.g.*, objectives b) and c)), are extremely complex, and multi-tiered. They are composed of a primary objective (respectively, exploitation of marine resources and ecosystem services, and organization of uses and activities), which is related to the achievement of underlying objectives (including preservation of the marine environment, while maintaining Good Environmental Status, in the first case, and respecting the marine ecosystem and underwater cultural heritage, and job creation, in the latter). This different complexity is inescapably reflected in the number of indicators proposed for each objective and, consequently, on the relative weight of each objective in the resulting indicator set.

The literature review carried out suggests that despite the existence of a great number of indicators to assess the state of the marine environment, very few references focus on their relationship with maritime activities and with the specificities of MSP. When they do (*e.g.*, Plan Bothnia), they only offer general pointers for measuring the effects of selected activities. It could be argued that the impacts of any given activity (environmental, social and economic), namely given their inherent specificities, are best evaluated at the project monitoring level ensuing from the corresponding Environmental Impact Assessment process. However, unless the effects of maritime activities integrate the higher ranking, global MSP evaluation framework, there will be a diminished possibility to act on existing stressors and to effectively adapt management actions to counter them.

For the reasons presented above, we believe that this set of indicators from Portugal, particularly considering the range of activities it encompasses, when fully developed and stabilized, can set the stage for improved evaluation frameworks in other MSP efforts worldwide. Next steps include: i) the verification and refinement of this indicator set by a panel of Portuguese and international experts on evaluation and MSP, and, building on it, ii) the development of a comprehensive framework for the evaluation of MSP initiatives. Such a framework should allow for the organization of these discrete indicators into a coherent whole, providing a measure of the distance from achieving sustainability objectives, the ultimate goal of MSP. It should also contribute to highlight gaps, not only in terms of needed information, but also in terms of important concerns for MSP that current frameworks may not address, such as impacts of MSP on human health or seascapes.

CONCLUSIONS

The set of indicators presented in this paper is a starting point for the development of a comprehensive evaluation framework of the MSPM of the Portuguese NMS. Given the size and geostrategic position of Portugal's maritime area, and the wide range of maritime activities it encompasses, despite the necessary adjustments related to the unique contexts of each individual case, it may constitute a useful tool in the emerging field of MSP evaluation worldwide, in articulation with the UN's Sustainable Development Goals (particularly Goal 14).

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Performance evaluation for Portuguese Marine Spatial Planning

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Abstract

Ocean governance frameworks, including marine spatial planning (MSP), are generally aimed at achieving sustainable use of the marine environment and of its finite resources, and are increasingly being developed and implemented worldwide. Although the importance of evaluating the success of integrated ocean management initiatives is widely recognized, so is its complexity, and there is still limited knowledge or empirical experience on how to actually carry out such an evaluation. The main aim of this research is the development and testing of a framework to evaluate the performance of marine spatial plans (focusing on the outcomes). Portugal's maritime area totals c. 3,800,000 km^2, i.e., c. 4% of the Atlantic Ocean and 1% of the global Ocean. As one of the world's largest maritime nations, and with its ocean governance framework finalised in 2015, Portugal emerges as relevant case study. For the evaluation methodology showcased here, objectives of Portuguese marine spatial plans (MSPlans), as set out in national legislation published in March 2015, were matched to a preliminary list of indicators, selected from a literature review of scientific and technical references on the evaluation of policies and plans and expert interviews. Indicator selection was also supported by a review of ocean monitoring commitments assumed by Portugal, including the national monitoring related to the Marine Strategy Framework Directive, to identify and take advantage of potential areas of overlap, avoiding duplication of efforts, and minimizing implementation costs. The preliminary list of 65 performance indicators was fine-tuned through structured interviews with selected Portuguese and international experts, and resulted in a list of 37 indicators addressing many of the suggestions raised by the experts. The proposed approach contributes to evaluation of progress towards achieving sustainability objectives, the ultimate goal of MSP, and to highlight gaps, not only in terms of needed information, but also in terms of important concerns for MSP that current frameworks may not address. Despite the necessary adjustments related to the unique contexts of each individual case, the proposed framework may constitute a useful tool in the emerging field of MSP evaluation, supporting decision making and management processes, in articulation with the UN's Sustainable Development Goals (particularly Goal 14, for the Ocean).

Keywords: Marine spatial plans, performance evaluation, outcome evaluation, indicators, Sustainable Development Goals

1. Introduction

Marine spatial planning (MSP) has been defined as the "public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives (…)" (Ehler and Douvere, 2009, p. 18). Though relatively recent as an approach, it is being increasingly endorsed and used worldwide as a tool to the integrated management of growing human demands on marine resources (UNESCO-IOC, 2015). In fact, according to Flannery et al. (2016), MSP "has rapidly become the most commonly endorsed management regime for sustainable development in the marine environment" (p. 121). Although the importance of evaluating the success of integrated ocean management initiatives, particularly

MSP, is widely recognized (UN, 2016), so is its complexity, and there is still limited knowledge or empirical experience on how to actually carry out such an evaluation (Carneiro, 2013). However, the ever-growing human pressures on the marine environment, and the pivotal role of the ocean in determining sustainable development and ultimate well-being of humankind, makes such evaluation essential.

Portugal has been selected as an appropriate and relevant case study for the development and testing of a mechanism to evaluate the performance (focusing on the outcomes) of its marine spatial planning system for three main reasons:

- It is one of the world's largest maritime nations: Portugal's maritime area totals c. 3,800,000 km^2, i.e., c. 4% of the Atlantic Ocean and 1% of the global Ocean (Bessa Pacheco, 2013). Portugal alone has sovereignty/jurisdiction over almost 50% of marine waters in the European Union (Governo de Portugal, 2014);
- Unique strategic position, bridging between Europe, Africa, and the Americas (Diário da República, 2014a), not only in geographic but also cultural terms (privileged relations with coastal Portuguese speaking nations in Africa and South America);
- Brand new legal framework for MSP (MSP system), including: the National Ocean Strategy 2013-2020, published in February 2014, stating Portugal's strategic objectives for its national maritime space (NMS) (Diário da República, 2014a); the MSPM Law establishing the Basis of the Policy for Marine Spatial Planning and Management of the NMS, published in April 2014, whose main goal is to contribute to the sustainable development of Portugal (Diário da República, 2014b); and Decree-Law 38/2015 detailing aspects of the implementation of the MSPM Law and transposing the EU's MSP Directive (2014/89/EU of 23 July) (Diário da República, 2015).

As pointed out by Carneiro (2013), "What to evaluate depends unavoidably on the timing of the evaluation" (p. 216). Portugal is presently developing the Marine Spatial Plan – the Situation Plan – for the entirety of its NMS. However, even though no plans exist as yet, and "while (…) many tangible results could take 5-15 years to be realized, it's not too early to think about evaluating the results of MSP" (Ehler, 2014, p. VI).

Performance evaluation, an assessment of progress toward the achievement of pre-defined goals or objectives in planning, should ideally be based on a reduced and manageable set of explicit standards – indicators, which should be directly linked to intended objectives (e.g., Day, 2008; Laurian et al., 2010; Douvere and Ehler, 2011). Indicators can be defined as "quantitative/qualitative statements or parameters that can describe existing situations and manage changes or trends over time" (ibid., p. 307).

The indicator selection process should involve stakeholders through a collaborative approach (Ramos, 2009). The literature offers several likely important criteria for indicator selection, which often vary according to the purpose and scope of the evaluation, such as relevance, feasibility, information availability, cost-effectiveness, context sensitivity, time and space comparability, robustness and scientific credibility, concreteness, interpretability, specificity, i.a. (Hammond et al., 1995; IOC, 2006; Johnson, 2008; Vilares, 2010). In practice, often only two or three such criteria are effectively used to rank indicators (e.g., Ramos et al., 2004; Coelho et al., 2010).

For the purposes of the research reported here, a step-by-step approach was designed to develop a set of indicators that could constitute the core of an evaluation mechanism of the performance of the Portuguese MSP system (Figure 1).

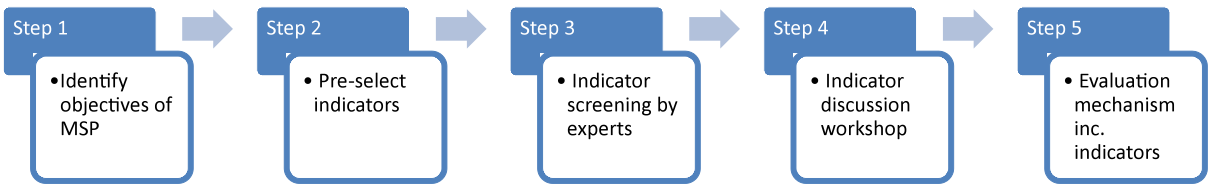

Figure 1. Step-by-step approach adopted to develop a set of indicators that could constitute the core of an evaluation mechanism of the performance of the Portuguese MSP system.

The first step involved the identification of the most appropriate source of objectives to assess performance of national MSP. From the three legal instruments available, namely, NOS 2013-2020, MSPM Law, and Decree-Law 38/2015, the latter, stating the objectives of (future) Marine Spatial Plans, emerged as the most appropriate level of analysis. In step 2, indicators were tentatively matched to these objectives, excluding objective a) for its strategic nature and vague phrasing, and for not being specifically related to MSP (Table 1). Such indicators were selected from a literature review of scientific and technical references on the evaluation of ocean governance initiatives, particularly MSP and MSPlans, including the implementation of international conventions and commitments, and European Directives pertinent to maritime issues and sustainable development. A review of ocean monitoring commitments assumed by Portugal was also carried out to take advantage of areas of overlap, to avoid duplication of efforts, and minimize costs, hoping to increase the likelihood of the implementation of such a monitoring and evaluation mechanism. In step 3, the 65 indicators were screened through one-on-one expert interviews. The ensuing analysis produced a new, reduced, set of indicators, to be debated in an expert workshop (step 4). The final stage, step 5, integrates the resulting set of indicators and proposes an evaluation mechanism for the Portuguese MSP system.

Table 1. Objectives of Portuguese Marine Spatial Plans, stated in Decree-Law 38/2015, followed, in parentheses, the number of indicators proposed for each objective. Objective a) was not included in this analysis due to its strategic character and lesser relevance to MSP.

a) To implement the objectives of strategic development established in the strategic instruments of the spatial planning and management of the national maritime space, namely in the National Ocean Strategy (0);
b) To promote the sustainable economic, rational and efficient exploitation of marine resources and ecosystem services, ensuring the preservation, protection and recovery of natural values and coastal and marine ecosystems and the good environmental status of the marine environment, as well as of coastal and transition waters, preventing the risks of human action and minimizing the effects of natural catastrophes and climate change (46);
c) To align (order) the uses and activities to be developed in the national maritime space taking into account the marine ecosystems and the safeguard of underwater cultural heritage, aiming to ensure the sustainable use of resources and fostering creation of employment (7)
d) To prevent or minimize eventual conflicts among uses and activities developed in the national maritime space (4);
e) To ensure legal certainty and transparency of the procedures entrusting the rights of private use in the national maritime space (6);
f) To ensure the use of available information on the national maritime space (2).

Steps 1 and 2 of this approach have already been presented in Ferreira et al. (2016). In this paper we present the methodology and the results of stage 3.

2. Methods

National and international interviewees were selected based on their expertise in the fields of MSP and/or planning evaluation. These included MSP practitioners, members of various branches of

academia (biology, ecology, law, geography), experts on indicators, independent consultants, non-governmental organizations (NGOs) (Table 2).

Semi-structured interviews were conducted as per standard social science protocol (e.g., Bernard, 2006). The interviews were structured around the list of 65 indicators. Interviewees were asked to rank indicators in terms of relevance (direct link with policy objectives), and feasibility (operationalizing capacity) (Ramos et al., 2004). They were asked to rank both criteria using a scale of 1 (low relevance or feasibility) to 3 (high relevance or feasibility). No answer, or non-applicability were recorded as 0 (Coutinho, 2014).

The interviews included open-ended questions related to an overall evaluation of the methodology with the possibility to comment on proposed indicators and/or to propose additional indicators. It was assumed that the interviewees would guide the discussion towards topics of genuine concern.

Interviews took place in person or by telephone. All interviews were recorded (contingent on participants' permission) to enhance accuracy and completeness of the data record and later analysed for content.

In the analysis of results, the most important indicators should be the ones with a total score of six (sum of both criteria). Relevance was ranked as the main criterion, followed by feasibility.

3. Results and discussion

Twenty-four interviews were conducted between December 2015 and March 2016 (Table 2). Eighteen interviews yielded quantitative results for the indicators under scrutiny (Table 3). The remaining interviews (six of the international experts interviewed) produced qualitative information, focusing on suggestions to develop and simplify the set of indicators presented and offering suggestions for the introduction of other indicators.

Table 2. Categories and numbers of interviews.

National/international	Institution	No. interviews
National	National agencies (MSP)	4
	National accounting bureau (indicators)	1
	Academia (incl. Azores and Madeira)	9
	NGO	1
International	MSP Practitioners	2
	Academia (MSP experts)	3
	Independent Consultants/NGOs	3
	Accounting (EEA)	1

Interviewees commented on the large number of indicators proposed for objective b) and on the unbalance in the number of proposed indicators for each objective, but recognized it as a direct consequence of the difference in complexity of the various objectives (cf. Table 1). Figure 2 shows the results of the scoring of the indicators proposed for objective b): absolute values for each of the criteria are presented in the primary axis (maximum possible score of 54), and the total score (sum of relevance and feasibility) of the 46 indicators is presented in the secondary axis (for a maximum possible score of 108, achievable if the eighteen interviewees had given the maximum grade of

three to both criteria for that indicator). Despite criticising the large number of indicators proposed, almost half of the participants found it difficult to effectively reduce the number of indicators, by attributing the highest score to ¾ or more of the 46 indicators proposed. Some participants acknowledged a difficulty in distinguishing between the individual importance of a given indicator in a general setting, and its strict relevance in this particular evaluation framework. I.e., although in general applications one indicator may be deemed important, it may be irrelevant for an evaluation of the current framework. In practice, this acknowledged difficulty may have contributed to raise the (overall) relevance scores of the indicators.

Based on these results, the twelve indicators with a score higher than 70 were retained, even if merged or renamed (Figure 2 and Table 3). The remaining indicators were, nevertheless, also analysed in terms of the comments received so as to be adapted, merged with others or discarded.

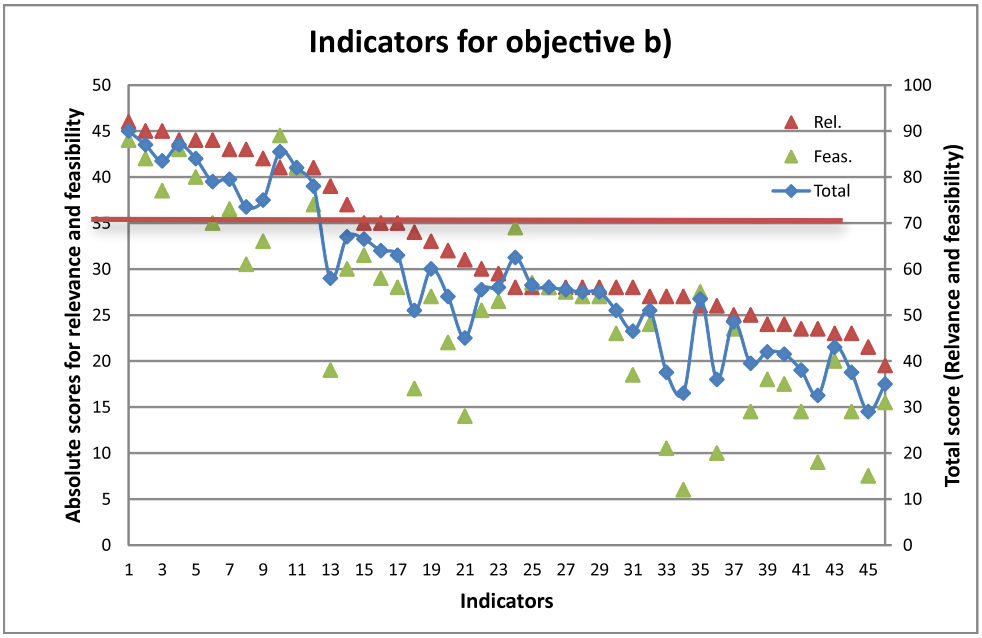

Figure 2. Indicators for objective b). Maximum possible score for each criterion was 54, and 108 for the sum of relevance and feasibility. Although the indicators are independent from each other, a connecting line was inserted in the total score series as a visual aid. The red line marks the threshold of the total score above which indicators were retained for further analysis.

The lower scores received by indicators relating to objectives e) and f) reflect some degree of dissatisfaction with the indicators proposed, for being too broad or general (Table 3). For all objectives a number of indicators were suggested by participants and integrated in the indicator set presented below (Table 4).

Interviewees generally suggested a reduction in the overall number of indicators – one participant suggesting only 4-5 indicators as a starting point – and that they should focus on measuring the direct results of the implementation of MSP, looking at the specificities of the process, so as to promote the concreteness and the interest of the evaluation. Also, an overall structure or framework should be sought to establish and clarify relations between indicators, rank and prioritise them, and avoid duplications or “double-counting”.

The importance of focusing on trends, and of establishing a reference framework with known baseline conditions and predefined, time-bound targets, was stressed by various participants.

Table 3. Synthesis of results: For each objective of Decree Law 38/2015 (Obj.), proposed indicators are ranked by relevance (Rel.) and feasibility (Fea.). Total classifications (Tot.) refer to a possible maximum of 108 points (had an indicator received the maximum score from all 18 interviewees).

Obj.	Indicator (unit)	Rel.	Fea.	Tot.
b)	Coastal & marine area protected (%)	46	44	90
	Private investment in the national maritime space (€)	45	42	87
	GAV by sector of maritime economic activity (€)	45	39	84
	State of coastal and transition waters (WFD)	44	43	87
	Certified fisheries (%)	44	40	84
	Environmental Status of the marine environment (MSFD)	44	35	79
	Contribution of maritime economic activities in the trade balance (€)	43	37	80
	Changes in the use of maritime space (%)	43	31	74
	Public and private investment in RDT by sector of maritime activity (€)	42	33	75
	Requests to use the national maritime space (No.)	41	45	86
	Electricity generated from marine renewables (%, GWh)	41	41	82
	Certified aquaculture (%)	41	37	78
c)	Marine areas and coastline with formulated/adopted ICM/MSP plans (%)	51	44	95
	Employment rate in maritime sectors (%)	51	36	87
	Zoning plans and regulations completed, approved & implemented (%)	42	33	75
	Applications where there are potential impacts on a site designated for historical environment (No.)	39	38	77
	Monitoring & mapping of new historical environment sites discovered as part of a development (%)	39	27	66
	Condition of sites designated for historical environment (qual.)	39	19	58
	Employment rate of population aged 20-64 (%)	26	21	47
d)	Applications refused due to incompatibility with other marine uses (No.)	52	46	98
	Conflicts in the use of maritime space by type and frequency (No.)	48	27	75
	Applications where there are potential impacts on the marine environment as a result of infrastructure development (No.)	35	21	56
	Reported navigational accidents as a result of a marine development (construction or operation) (No.)	33	35	68
e)	Access to meeting documents (% requests)	32	17	49
	Access to data (% requests)	30	20	50
	Licenses refused (No.)	27	24	51

	Rules concerning the participation of civil society observers (Qual.)	24	13	37
	Conflicting processes at one-stop-shop (No.)	23	23	46
	Access to compliance and performance measures (No.)	23	8	31
f)	Existence of a system of annual update (Binary)	33	22	55
	Incorporation of knowledge into management plans (Quant.)	26	12	38

Participants also felt that it was too early in the planning stage to focus on plans which were not yet fully developed. Instead, they suggested shifting the focus to the Portuguese marine spatial planning system, currently composed by the NOS2013-2020, the MSPM law and Decree-Law 38/2015. Such refocusing would allow the immediate, more straightforward and more concrete development of indicators to monitor the implementation of specific aspects of the legal framework, and render the evaluation system more meaningful to users.

General concerns were also presented in terms of the temporal and spatial resolution of the indicators, including, for the latter, a careful consideration of the units in which the indicators are measured. These concerns stem from the sheer dimension of the Portuguese national maritime space, and the logistics behind maintaining regular data collection. Also, for such a vast space, figures presented as percentages may disguise or obliterate important quantitative changes.

There was no consensus on whether or not to include objective a): while some interviewees agreed that its phrasing was too broad to allow for the suggestion or identification of adequate indicators, others felt that it was necessary to include it in order to have a complete overview of objectives, and as the right place to include aspects left out in the other objectives.

Along these lines, some participants suggested that the focus of the analysis should be broader than, or not limited to, stated legal objectives, to allow the integration of other important aspects, such as: participation, coherence with other planning systems (namely the integration of terrestrial with marine planning), benefit sharing, cumulative effects, the precautionary principle, environmental impact assessment, strategic environmental assessment, quality of life, self-esteem, well-being. Despite the subjectivity, difficulty in establishing a direct link with MSP, and estimated low feasibility of the latter three, these aspects were deemed important by a number of participants as metrics of the outcomes of MSP and its contribution to sustainable development. In this respect, Strategic Environmental Assessment was mentioned by several participants as a hub to integrate all these concerns.

The integration of these results yielded the indicator set presented in Table 4. Each of the 37 indicators, briefly described in the text below, includes a code, the indicator name and measurement unit.

Monitoring being carried out in the framework of the European Marine Strategy Framework Directive (MSFD) and Water Framework Directive (WFD) will feed directly into indicators B1 and B2, which are, therefore, considered “placeholders” of the results of these assessments. Any changes perceived as negative may act as warning signs prompting the adoption of corrective measures in the framework of MSP. The WFD, although it applies to a minute fraction of the national maritime space, is particularly important as an indicator of pollution from land-based sources affecting the marine environment, and concomitantly, as an indicator of the land-sea interaction.

Requests to use the NMS and changes in its use (B3 and B4) are intended as metrics of potential and fulfilled interest in the use of such space, respectively. The latter includes the percentage of common use which reverts to private use, be it for private activities or for public uses, such as nature conservation, and defence. Both can be disaggregated in a number of more specific parameters.

The condition of Marine Protected Areas (MPAs) (B5), refers to the conservation status (e.g., good, reasonable, bad) of all types of MPAs (Natura 2000, OSPAR, nationally protected areas, etc.). It is hoped that this indicator can provide a measure of the effects of the management of the NMS in preserving natural values.

Table 4. Revised indicators for each objective of Decree Law 38/2015 (Obj.).

Obj.	Code) Indicator name (unit)
b)	*B1) Environmental status of the Marine Environment (Variable: MSFD)*
	B2) Status of coastal and transition waters (*Variable: WFD*)
	B3) Requests to use the national maritime space (No.)
	B4) Changes in the use of the national maritime space (Area or %)
	B5) Condition of Marine Protected Areas (MPAs) (*Qual.)*
	B6) Investment in the national maritime space (public and private) (€)
	B7) Contribution of the sea economy to the Gross Domestic Product (GDP) (%)
	B8) Gross Added Value (GAV) by sector of maritime activity (€)
	B9) Authorizations for research or pilot projects (No.)
	B10) Ecosystem services – Well-being: cultural/spiritual value of the sea (Qual.)
	B11) Activities with sustainability certification (No. or %)
	B12) Measures revoked or amended due to incompatibility with MSP instruments (No.)
	B13) Sand extraction areas in the NMS to combat coastal erosion (M m^3 or km^2)
c)	*C1) Area of the NMS with fully effective MSP (km^2 or %)*
	C2) Area of the NMS which is protected (%)
	C3) Activities/unit area (No.)
	C4) Processes of Environmental Impact Assessment (No.)
	C5) Condition of sites designated for their underwater cultural heritage (Qual.)
	C6) Employment in maritime sectors (No. or % of total employment)
	C7) Diversity of livelihoods related to the sea (No. or index)
d)	*D1) Conflicts in the use of the national maritime space by type and frequency (No.)*
	D2) Requests refused for being incompatible with other activities (No.)
	D3) Relocation of existing uses or activities (No.)
	D4) Renunciation to the rights of use (No.)
	D5) Titles changed/altered by degradation of the environmental status (No.)
e)	*E1) Titles decided by a public bidding process (No. or %)*
	E2) Titles not granted to original applicant (No.)
	E3) Revenue and use of taxes by type (€)

E4) (Public and private) costs of relocation or compensation (€)

E5) Information requests (No. and %)

E6) Fulfilment of procedural deadlines (No. or %)

E7) User satisfaction (Qualitative)

E8) Complaints (No. and %)

f) *F1) Existence of a geoportal on the national MSP system (Binary: Y/N)*

F2) Geoportal updates (No. or rate)

F3) Existence of mechanisms of information sharing (Binary: Y/N)

F4) Measures incorporated in plans as a result of new information (No.)

Private and public investment in the NMS, including public investment in MSP (B6), can provide a measure of intended or actual economic interest in this space. A related indicator is the contribution of the sea economy to the Gross Domestic Product (GDP) (B7). Although the value of GDP as an indicator is being increasingly criticized, particularly because it "overlooks the contribution of natural assets to wealth, health, and well-being" (OECD, 2011, p. 10), it relates directly to one of the strategic objectives of the NOS 2013-2020 (to promote an increase of the contribution of the sea economy to the GDP by about 50% until 2020). The Gross Added Value (GAV) by sector of maritime activity (B8) is intended to provide a better understanding of the individual contribution of existing and emerging activities to the sea economy.

The number of authorizations granted for research or pilot projects (B9) (eventually coupled with the number or fraction of such projects materialized in investment) is a measure of the interest in scientific research and technological development in the NMS.

Indicator B10 aims to provide a measure (even if subjective/qualitative) of the importance of the sea in people's lives and livelihoods (including non-consumptive uses, such as leisure) and how MSP affects it, positively or negatively. It is therefore intended as a metric of how MSP relates to well-being in terms of cultural/spiritual value of the sea, and a proxy for the evaluation of this type of ecosystem services. The number or percentage of economic activities with sustainability certification (B11), as it implies conformity with applicable regulations and patterns, is also proposed as an indicator of environmental sustainability.

Indicators B12 (Measures in territorial plans or programmes revoked or amended due to incompatibility or non-compliance with MSP instruments) and B13 (sand extraction areas in the NMS to combat coastal erosion), together with indicator B2, discussed above, are proposed as metrics for an evaluation of how the land-sea interaction is tackled at the governance and planning level. Indicator B13 is also intended as a measure of efforts to minimizing effects of natural catastrophes and climate change, the last aspect mentioned in objective b (cf. Table 1).

For objective c), related to the spatial planning of uses and activities, the area of the NMS with fully effective (i.e., elaborated, approved and implemented) MSP (C1), is proposed as a metric to evaluate progress of regional and national planning. Indicator C2, the area of the NMS which is protected, is related to international targets and obligations, namely the Aichi target and the United Nations Sustainable Development Goal of achieving a minimum of 10% of coastal and marine areas conserved by 2020 (UNEP, 2010; UNGA, 2015). Indicator C3 (Activities/unit area) is proposed as a measure of the coexistence of uses and efficiency in the use of the NMS.

The number of Environmental Impact Assessment for projects carried out in the NMS (C4) is proposed as a proxy of potential impacts on the marine environment generated by the activities under evaluation.

The condition of sites designated for their underwater cultural heritage (C5) is intended as a qualitative measure of the effects of the management of the NMS on the conservation status of such sites.

Employment in maritime sectors (C6) offers insight into economic and social aspects of MSP. It should provide information not only on jobs created, but also on jobs lost (thus integrating a consideration of the effects of new uses over existing ones), and on the average qualification of workers. The diversity of livelihoods related to the sea (C7) is a related indicator but with a different focus, centred on assessing the diversity of opportunities to sustain present and future generations. It is envisioned as a measure of local social resilience, akin to the diversity indexes so often used in ecology.

For objective d), five indicators are proposed. The number of conflicts in the use of the NMS by type and frequency (D1), is a measure of real conflict between: common uses, common and private uses, and private uses (sporadic, frequent, permanent). The number of private title requests refused for being incompatible with other activities (D2) is proposed as a measure of conflict prevention. The relocation of existing uses or activities (D3), including a discrimination of uses relocated on grounds of public interest, is envisioned as a measure of conflict minimization in the use of the NMS. A related indicator (D4) is the number of renunciations to private use titles as a result of the relocation of a use or activity. Also, the number of titles changed/altered by a degradation of the environmental status (D5) intends to show if/how the degradation of the environmental status (under the MSFD and/or the WFD) affects the activities taking place in the NMS.

For objective e), the number (or %) of titles decided by a public bidding process (E1), and the number of titles not granted to the original applicant (E2) are proposed as measures of legal certainty and transparency of legal procedures, including publicity, and participation.

Indicator E3 monitors the correct application of the taxes over marine activities, i.e., assesses if and how such taxes are being used as intended to ensure ocean monitoring, conservation, and surveillance. Indicator E4 (public and private costs of relocation or compensation), monitors the cost of relocating activities and who pays such relocation (whether it is public or private).

Indicators E5 to E8 offer metrics of public participation and access to procedural information (E5), predictability (E6), and user satisfaction related to the processes, namely their length and cost (E7), and conflict (E8).

Lastly, objective f), related to ensuring the use of the available information on the NMS, was found by participants as one of the most important objectives but also one of the most challenging. The limited number of indicators proposed reflects this difficulty. Most participants considered the existence of a single geoportal on the NMS (F1), one which is accessible and updatable by the various relevant institutions, to be crucial. This indicator is also related to the objective of transparency. The number or rate of geoportal updates (F2) contributes to evaluate the quantity of new information being used. The existence of mechanisms of information sharing (F3), particularly among national agencies relevant to MSP, was also deemed crucial, particularly by participants from agencies. Finally, the number of measures incorporated in plans as a result of new information (F4) is proposed as a measure of the actual use of available information.

In this step of the methodology we were able to reduce the number of indicators to approximately half, while broadening the range of topics covered, addressing many of the suggestions raised by the experts in terms of the incorporation of such topics as participation, coherence with terrestrial planning, environmental impact assessment, benefit sharing and well-being – critical elements in the determination of the sustainability of adopted options. The resulting set of indicators was discussed and further refined at an international workshop, the results of which are still under review, and will provide the basis for the development of a comprehensive evaluation framework of the MSP and management of the Portuguese sea, and of its contribution, as intended, to the sustainable development of Portugal and Europe's seas.

4. Conclusions

Given the pivotal role of the ocean in determining sustainable development and ultimate well-being of humankind, evaluating the success of integrated ocean management initiatives, particularly MSP as the framework managing the ever-growing human pressures on the marine environment, is essential. However, there is still limited knowledge or empirical experience on how to actually carry out such an evaluation.

Portugal is a relevant case study for the development and testing of a mechanism to evaluate the performance of its marine spatial planning system. The set of indicators presented in this paper, integrating the views and suggestions of twenty-four international experts on the subject, constitutes one of five steps in the development of a comprehensive evaluation framework of the MSPM of the Portuguese NMS and of its contribution to the sustainable development of Portugal and Europe's seas.

The proposed approach thus contributes to evaluation of progress towards achieving sustainability objectives, the ultimate goal of MSP, and to highlight gaps, not only in terms of needed information, but also in terms of important concerns for MSP that current frameworks may not address. Despite the necessary adjustments related to the unique contexts of each individual case, the resulting framework may constitute a useful tool in the emerging field of MSP evaluation, supporting decision making and management processes, in articulation with the UN's Sustainable Development Goals (particularly Goal 14, for the Ocean).

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How strategic is the Strategic Environmental Assessment of future Portuguese marine spatial plans in the European context?

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Abstract

In the European context set by Directive 2001/42/EC and its transposition into national legal frameworks, (Strategic) Environmental Assessment (SEA) is mandatory for plans and programmes likely to have significant environmental effects. Portugal's national maritime space (NMS) includes c. 50% of marine waters of the European Union and covers 4% of the Atlantic (c.1% of the global Ocean), making it one of the world's largest maritime nations. Since 2014, new Portuguese legislation has been published pertaining to marine spatial planning and management (MSPM) creating a system that comprehends two levels of instruments: strategic instruments (the National Ocean Strategy, NOS2013-2020); and operational instruments (MSPlans), including the Situation Plan for the entire NMS, which will represent and identify "the spatial and temporal distribution of existing and potential uses and activities" as well as "natural and cultural values of strategic relevance for environmental sustainability and intergenerational solidarity". Although this Situation Plan is more akin to a "reference situation" than to a "Plan", the significance of its potential and expected environmental effects led the Portuguese government to decide subjecting it to SEA. Still, in the current Portuguese MSPM system, prospective and strategy are found at the level of the NOS2013-2020 that adopted the 2012 European Commission's "Blue Growth" vision for the maritime sector, which, in turn, constitutes "the maritime dimension" of EUROPE 2020, the 2010 EU strategy for "smart, sustainable and inclusive growth". This hierarchy of instruments, from the European to the Portuguese national level, sequentially guided and framed strategic options for each lower ranking level. In this context, two questions emerge: Were any of these levels in the policy/planning hierarchy subjected to environmental assessment? and, How "strategic" can SEA of a future Situation Plan actually be? A revision of the types of assessments carried out for these instruments showed that no other plans, programs or strategies, along the hierarchy where the Situation Plan is included were subjected to environmental assessment (the POEM, a study for a MSPlan developed between 2008 and 2010, was subjected to SEA but it only applies to c. 8.5% of the NMS, and was carried under different socio-economic and legal/political conditions). Environmental assessment of the proposed Situation Plan, the key operational instrument of the Portuguese MSPM system, is a necessary step towards ensuring the proposed national sustainable development objective. We propose it should follow a strategy-based approach in view of the nature, scope and relevance of the issues at stake. Besides incorporating MSPM principles, SEA of the Situation Plan should encompass other key aspects for the success of MSPM of the Portuguese Atlantic Ocean: build on long-term scenarios accommodating the duration of planned licences (25 y) and concessions (50 y); take global change as a major factor for strategic scenarios development, together with societal, demographic and economic drifts, all covering similar time spans. Scale and value of Portuguese NMS implies that success or failure of its MSPM process will have significant impacts on MSPM of European Maritime Space, making this process a European and global milestone.

Keywords: MSP, SEA, Situation Plan, Portugal

1. Introduction

1.1. The Strategic Environmental Assessment perspective

Strategic Environmental Assessment (SEA), as set forth by EU Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (OJEU, 2001), stems from the evaluation of transboundary environmental impacts, in the framework set by the UN Convention on Environmental Impact Assessment in a Transboudary Context, adopted in Espoo in 1991 and amended in 2001 (UN, 2015). This accounts for a widely spread practice where SEA is viewed as an impact assessment-based approach, differing from a traditional Environmental Impact Assessment in that its object is a policy, plan or programme (PPP) instead of a project (Fischer, 2007; Noble and Nwanekezie, 2016).

A different conceptualization of SEA as a strategy-based approach capable of influencing the development and application of PPPs and as such, as a process for influencing the decision-making process and driving institutional change, constitutes the opposite end of the gradient from less to more strategic approaches SEA can assume (Noble and Nwanekezie, 2016).

As van Doren et al. (2013) suggest, the impact of SEA on decision-making will be more significant if it is explicitly used as a tool to develop policy, as opposed to merely being used to review predefined proposals, when SEA still has value but its contribution to the planning process is strongly reduced and opportunities are lost for relevant decision-making processes where social, economic, and environmental interests are at stake.

Within this conceptual framework, SEA can and should become instrumental in influencing the political decision-making process towards a better environmental performance, thus assuming a major advocacy role for effective sustainability (Partidário, 2015).

1.2. The Portuguese National Maritime Space and its spatial planning and management system

Portugal is one of the world's largest maritime nations. Its national maritime space (NMS) comprises 1,700,000 km^2 of ocean area that includes territorial seas and exclusive economic zones of the mainland, and of the archipelagos of Madeira and the Azores (Bessa Pacheco, 2013). This amounts to 41% of the maritime space of the European Union, and an estimated 48% of the total volume of its marine waters, under Portuguese sovereignty or jurisdiction (Governo de Portugal, 2014). With an additional 2,100,000 km^2 of proposed extended continental shelf, Portugal's total NMS encompasses c. 3,800,000 km^2, roughly 4% of the Atlantic Ocean's area and c. 1% of the global Ocean (Bessa Pacheco, 2013).

Therefore, Portugal's approach to its ocean management will arguably be relevant all the way from national to European and global levels.

Since 2014, a new Portuguese legal framework has been published which defines Marine Spatial Planning and Management (MSPM) of the Portuguese NMS:

- in February 2014, the National Ocean Strategy 2013-2020 (NOS 2013-2020) and its associated action plan (Plan Mar-Portugal) was published (Diário da República, 2014a), replacing its forerunner, the NOS 2006-2016;

- in April 2014, the National Law establishing the Basis of the Policy for Marine Spatial Planning and Management of the National Maritime Space (MSPM Law), whose ultimate aim is to contribute "to the country's sustainable development" (Diário da República, 2014b, p. 2358); and

- in March 2015, a Decree-Law (Decree-Law 38/2015) developing important aspects of the implementation of the MSPM Law and transposing the EU's Marine Spatial Planning (MSP) Directive (Diário da República, 2015a).

The national MSPM system thus created comprehends different levels of policy instruments, ranging from strategic, namely the National Ocean Strategy 2013-2020, to operational, the MSPlans. According to both the MSPM Law and its corresponding Decree-Law, these

operational MSP instruments include a Situation Plan for the entire national maritime space, and a number of allocation plans, one for every additional/new use or activity in the NMS (Diário da República, 2015a).

The Situation Plan will cover the entire NMS and include "The identification and spatial and temporal distribution of existing and potential uses and activities" (Diário da República, 2015a, p. 1527), namely aquaculture, marine biotechnology, marine mineral resources, energy resources and renewable energies, scientific research, recreation, sports and tourism, underwater cultural heritage and, equipments and infrastructures. It will also identify "natural and cultural values of strategic relevance for environmental sustainability and intergenerational solidarity" (ibid), including Marine Protected Areas (MPAs) and special conservation and protection areas classified within national and European frameworks, e.g. EU's Natura 2000 network. This plan will also include "identification of networks, infrastructures and systems needed for national defence and security and for civil protection" (ibid.).

The Situation Plan can be phased according to the three maritime zones identified in the MSPM law: territorial seas, EEZs, and the extended continental shelf.

Allocation plans correspond to new uses or activities not identified in the Situation Plan and upon approval they immediately integrate the Situation Plan promoting its corresponding automatic amendment.

1.3. SEA in the Portuguese MSPM system

In view of its potential and expected significant effects on the environment, the Situation Plan directly falls under the scope of EU's 2001/42/EC Directive on Strategic Environmental Assessment that aims "to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development" by ensuring that "(…) an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment" (SEA Directive, 2001/42/EC, p. L 197/32).

This view was adopted in the 11494/2015 Dispatch from the Portuguese Minister of Agriculture and the Sea that defined that "The situation plan is subject to environmental assessment under Decree-law 232/2007" (Diário da República, 2015b, p. 29495), the diploma that transposed the above mentioned EU Directive 2001/42/EC into the Portuguese legal framework.

As defined in Decree-law 38/2015, the Situation Plan is more akin to a "reference situation" than to an effective plan (in fact, its own designation suggests as much), in that it is viewed as a set of "written and graphical elements" that identify and zone present and prospective uses and activities in the Portuguese NMS, impending territorial plans and programs, environmental and use values and restrictions, and that locate elements pertaining to navigation, artificial islands, installations and structures.

In fact, within the current Portuguese MSPM system, prospective and strategy are to be found at the level of the National Ocean Strategy (NOS) 2013-2020. The NOS is based "on a new paradigm for sustained development, guided by the vision of the European Commission for the maritime sector: 'Blue Growth'" (Diário da República, 2014a, p. 1317). The Blue Growth strategy (European Commission, 2012), in turn, constitutes "the maritime dimension" of EUROPE 2020, the 2010 EU strategy for "smart, sustainable and inclusive growth" (European Commission, 2010). In practice, this hierarchy of instruments, from the European to the Portuguese national level, sequentially guided and framed strategic options at each lower ranking level, effectively narrowing the range of available strategic options.

In this context, two questions emerge: Were any of these levels in the policy/planning hierarchy subjected to a Strategic Environmental Assessment, so as to evaluate to what level sustainable development is actually being promoted? And, how "strategic" can a Strategic Environmental Assessment of the future Situation Plan actually be? The following sections present tentative answers to these questions.

2. Methods

SEA can be viewed as the construction and comparative evaluation of alternative strategic development visions and perspectives, integrating biophysical, economic, social and political considerations (Dusik and Xie, 2009). This type of environmental assessment applies to the highest level in the planning and decision process, hence its strategic character. Where PPPs are part of a hierarchy, the SEA framework advocates avoiding duplication of assessments. As Therivel (2014) points out "… because of tiering, SEA has the potential to promote more streamlined decision-making, where decisions taken at one planning stage (using SEA at that stage) may not need to be revisited at subsequent stages of decision-making (and their SEA or EIA)" (p.17).

The hierarchy of instruments that are the core of this analysis is synthesized in Figure 1, ranking from the key European policy instruments that define Europe's strategic options, down to the Portuguese legal framework for MSP, and is proposed operational instruments.

To answer the questions presented above, an analysis was carried out of the types of evaluations they were subjected to and on the appropriateness of SEA at every level. It is followed by a discussion of the range of possibilities available for an SEA of the situation plan.

Figure 1. Hierarchy of European and national Portuguese instruments framing Portugal's MSP.

3. Results and discussion

3.1. Were any of these levels in the policy/planning hierarchy subjected to an SEA, so as to ensure that sustainable development is actually being promoted?

In its transitory dispositions, Decree-Law 38/2015 stipulates that until the adoption of the Situation Plan, the Portuguese Maritime Spatial Plan (POEM) is to be taken as the reference situation for MSP of the NMS and for the allocation of all private use titles. The POEM was the first attempt at MSP in Portugal, having been developed between 2008 and 2010 only for the EEZ of the Portuguese mainland (Frazão Santos et al., 2014). Still, it was never published or recognized as an effective plan and was later, in 2012, published online as a study (Calado and Bentz, 2013; Frazão Santos et al., 2014). Although the POEM was subjected to SEA (MAOT, 20120), it must be stressed that this cannot be translated into the present situation plan due to three main

reasons: i) the POEM covered only about 8.5% of the territory encompassed by the situation plan; ii) it was developed more than 6 years ago, in a very different context, both in socio-economic and legal terms; and iii) the corresponding SEA process was also never duly closed, namely lacking the respective public consultation phase.

Although the Situation Plan will include "*strategic*, legal, technical and scientific bases of its indications and determinations" (emphasis added), the MSPM law clearly states that the strategic level of MSPM in Portugal is the NOS2013-2020 (Diário da República, 2015a).

The NOS 2013-2020 and its associated action plan (Plan Mar-Portugal) underwent a public consultation process prior to publication (DGPM, 2013) but, unlike other Portuguese national strategies, as, e.g., the Portuguese National Integrated Coastal Zone Management strategy, which had a voluntary SEA process (Partidário, 2009), it was not subjected to SEA. The ensuing legislation establishing the MSPM Law was only subject to discussion in the Portuguese parliament (Becker-Weinberg, 2015; Frazão Santos et al., 2015).

As mentioned above, the NOS 2013-2020 adopted the sustained development model of the 2012 European Commission's "Blue Growth" strategy, the maritime arm of EUROPE 2020. Both initiatives chart the EU's strategic course/route until 2020, and, consequently, that of its member states. The three themes of EUROPE 2020 (smart growth, sustainable growth and inclusive growth) were subjected to a public consultation carried out by the Commission (European Commission, 2015). For the Blue Growth communication, a study was conducted focusing on "Scenarios and drivers for sustainable growth from the Oceans, seas, and coasts" (Ecorys et al., 2012).

Because they are neither plans nor programmes, the SEA Directive does not apply, *sensu strictu*, directly to either strategy and they were published without an environmental assessment even though the SEA Protocol to the 1991 UN/ECE Espoo Convention, mentioned above and adopted by the EU in 2008 (OJEU, 2008), targets policies and legislation and endeavours "to ensure that environmental, including health, concerns are considered and integrated, to the extent appropriate, in the preparation of proposals for policies and legislation" (ibid., p. L 308/33). Also, according to Wood and Djeddour (1991, in Therivel, 2004, p. 12) "a policy… may be considered as the inspiration and guidance for action" and can be included in the bundle of "strategic actions".

Both at the European and Portuguese national levels, implementation of these strategies and corresponding visions is likely - and expected - to have significant environmental effects, but none was subjected to some kind of environmental assessment, meaning that no holistic, prospective and long-term assessment has been carried to ascertain the course they define as a significant contribution to the overarching aim of fostering and promoting sustainable development.

3.2. How "strategic" can the Strategic Environmental Assessment of the future Situation Plan actually be?

Besides being bound by the successive upper levels in the hierarchy that the Portuguese MSPM system integrates and the corresponding strategic and political options, according to Decree-law 38/2015, the Situation Plan is more akin to a "reference situation" than to an effective plan (cf. section 3.1., above). In this context, where the Blue Growth policy option has already been decided on, there appears to be little latitude for a strategic-based SEA of the future Situation Plan to develop and compare alternative strategic scenarios. The fact that certain development options may be considered promising in general terms, does not preclude the necessity of a detailed analysis to ascertain their adequateness to a particular context. The Blue Growth strategy is "an initiative to harness the untapped *potential* of Europe's oceans, seas and coasts for jobs and growth" (European Commission, 2012, p. 2, emphasis added). SEA of marine spatial planning, particularly because marine spatial plans are expected to have significant environmental effects, is the framework for identifying and evaluating the fulfilment of that potential (OJEU, 2014).

Moreover, aspects arise from the legal framework of the Situation Plan that constitute windows of opportunity for such an approach:

i. How to best ensure an appropriate organization and use of Portugal's NMS in view of its valorisation and safeguard, with the ultimate objective of the country's sustainable development?

ii. How to meet the principles of Portuguese MSP, namely the ecosystem approach, adaptive and integrated management, long-term valuation and promotion of economic activities, and regional and transboundary cooperation and coordination?

iii. While both EUROPE 2020 and the NOS 2013-2020 and its associated Plan Mar-Portugal target the 2020 horizon, licences to be granted for the Portuguese NMS by the MSPM system will be valid for up to 25 years and concessions for up to 50 years, taking us up to 2041 or up to 2066 (at least). How can operational MSP adapt and integrate such distinct objectives as the stability and security investors require and adaptation/reaction to change, including natural and anthropogenic?

Due to the nature, scope and relevance of the issues at stake, we believe that a Strategic Environmental Assessment along the process that led to the present Portuguese MSPM system must follow a strategy-based approach. In fact, as Lobos and Partidário (2014) identified, such an environmental assessment encompasses complex decision arenas; instead of product-oriented, it will have to be process-oriented; institutional and governmental capacities to support the underlying policy and planning process must be developed and strengthened and; constructive and collaborative dialogue is an absolute need for the process to be successful.

4. Conclusions

Despite defining national sustainable development as its ultimate aim (MSPM law), the Portuguese MSPM system and its strategic framework, from EUROPE 2020 to the NOS 2013-2020, did not undergo any environmental assessment approach.

The EU Sustainable Development Strategy includes the objective to ''safeguard the earth's capacity to support life in all its diversity, respect the limits of the planet's natural resources and ensure a high level of protection and improvement of the quality of the environment'' (Commission of the European Communities, 2005), while the precautionary principle under the Lisbon Treaty requires Environmental Sustainability as the foundation for the EU's commitment to sustainable development (Qiu and Jones, 2013). Thus, irrelevant of assuming a hard or a soft sustainability concept (ibid.), an environmental assessment of the proposed Situation Plan, the key operational instrument of the Portuguese MSPM system, represents a necessary step towards ensuring the proposed national sustainable development objective.

We propose a strategy-based SEA that accompanies, integrates and informs the development of the Situation Plan through collaborative dialog as the most suitable and beneficial approach to contribute to development of this plan and its underlying policy options, as opposed to an impact assessment-based approach merely reviewing a (more or less) predefined proposal, namely based on the existing POEM.

Rather than being a mere *pro forma* in the Situation Plan development process, solely to meet legal requirements, this approach can both promote identification of opportunities and contribute to better informed risk evaluations for potential future uses of the Portuguese NMS.

Besides incorporating the MSPM principles, including an ecosystem approach, adaptive and integrated management, long-term valuation and promotion of economic activities and, regional and transboundary cooperation and coordination, this SEA should encompass a group of key aspects for the success of MSPM of the Portuguese share of c. 4% of the Atlantic ocean:

1) SEA of the Situation Plan must build on long-term scenarios accommodating the duration of planned licences and concessions. Portuguese NMS and the European Atlantic will be widely different in 25 to 50 years;

2) Global change must thus be taken as a major factor for strategic scenarios development;

3) Societal, demographic and economic drifts and corresponding scenarios must also cover similar time spans.

We believe that the extension, scale, and value of the Portuguese NMS implies that success or failure of the Portuguese MSPM process will have significant impacts in the overall European Maritime Space and its spatial planning and management, making this process an European and global milestone.

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Crescimento ou Desenvolvimento Azul no "Mar Português"?

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Resumo

Com uma área marítima de quase 4 milhões de km^2 (incluindo 1 700 000 km^2 de mar territorial e zona económica exclusiva e 2 150 000 km^2 de plataforma continental estendida), Portugal tem soberania ou jurisdição sobre cerca de metade das águas marinhas da União Europeia (UE), 4% da área do Atlântico e c. de 1% do Oceano global. O Espaço Marítimo Nacional (EMN), incluindo o leito marinho, é potencialmente rico em recursos vivos e não vivos. Desde 2014, Portugal tem vindo a definir todo um novo quadro legal para o "Mar Português" (97% do território nacional), que tem, como objectivo inscrito na Lei de Bases da Política de Ordenamento e de Gestão do EMN, "contribuir para o desenvolvimento sustentável do país". O actual quadro legal, encimado pela Estratégia Nacional para o Mar 2013-2020, espelha as orientações das políticas marítimas desenvolvidas a nível da UE durante a última década, onde se destaca a "Estratégia de Crescimento Azul", o braço marítimo da Estratégia EUROPA 2020 "para um crescimento inteligente, sustentável e inclusivo". No momento em que a Europa e, destacadamente Portugal, olham para o Oceano como fonte de soluções para a crise económica, importa reflectir sobre o teor das políticas marítimas europeias e nacionais para este espaço vital, para assegurar a real sustentabilidade e equidade das opções tomadas. Quais as implicações da opção pelo crescimento ao invés do desenvolvimento azul? Haverá uma diferença real de abordagem? Para procurar responder a estas questões foi efectuada uma revisão do quadro legal nacional relativo ao ordenamento e gestão do Espaço Marítimo Português, procurando avaliar se, e de que forma, os opções adoptadas promovem a equidade e protecção ambiental essenciais a um desenvolvimento sustentável. Os resultados sugerem que o quadro legal Português, promove/favorece os novos usos face aos usos existentes, com potencial para gerar, ao invés de evitar, conflitos na gestão do EMN, gorando assim a consecução dos objectivos de sustentabilidade. A avaliação ambiental estratégica, a realizar no âmbito da elaboração do futuro plano de ordenamento do EMN, poderá contribuir para uma visão integrada, holística e sustentável do Mar Português e, por arrastamento, do Mar Europeu.

Palavras-chave: crescimento azul, desenvolvimento azul, indicadores, sustentabilidade, avaliação ambiental estratégica

1. Introdução

A opção por "desenvolvimento" na expressão "desenvolvimento sustentável", contida no famoso Relatório Brundtland (WCED, 1987), em detrimento de "crescimento", representou uma escolha deliberada, um reconhecimento, em 1987, de existência de limites ao crescimento num planeta finito. Trata-se de uma opção que privilegia "qualidade" em vez de

"quantidade", é baseada em maior eficiência e equidade na utilização dos recursos e resulta numa "ordem social superior", isto é, "tão preocupada com as gerações futuras como com a nossa, e mais focada na saúde do planeta e dos pobres do que em aquisições materiais e em poderio militar" (Brown et al., 1991, p. 97). Estes autores salientavam a distinção clara entre "crescimento" e "sustentabilidade", afirmando que "não é possível alcançar uma economia global ambientalmente sustentável sem que os mais afortunados limitem o seu consumo de forma a permitirem aos pobres aumentar o seu" (p. 97).

A adopção universal, pelo menos em papel, deste novo paradigma, ocorreu na Cimeira do Rio de Janeiro, em 1992. A primeira estratégia de desenvolvimento sustentável da União Europeia foi lançada em 2001, com base numa proposta da Comissão Europeia, e tinha como objectivo global "identificar e desenvolver acções para permitir à UE alcançar uma melhoria contínua e a longo prazo da qualidade de vida, através da criação de comunidades sustentáveis capazes de gerir e utilizar os recursos eficientemente, de tirar proveito do potencial de inovação ecológico e social da economia e, em última instância, de assegurar prosperidade, protecção ambiental e coesão social" (Comissão Europeia, 2015). A estratégia, entretanto já sujeita a várias revisões, apelava a uma nova abordagem na elaboração de políticas, que "assegurassem que as políticas económicas, sociais e ambientais da UE se reforçassem mutuamente" (ibid.).

Nesta linha, o 7º programa de acção da UE em matéria de ambiente, lançado em 2013 com um horizonte temporal até 2020, contém a seguinte visão ou "perspectiva relativa a 2050 [que] pretende ajudar a orientar a acção até 2020 e para além desse horizonte": "Em 2050, vivemos bem, dentro dos limites ecológicos do planeta. A nossa prosperidade e a sanidade do nosso ambiente resultam de uma economia circular inovadora em que nada se desperdiça e em que os recursos naturais são geridos de forma sustentável e a biodiversidade é protegida, valorizada e recuperada de modo a reforçar a resiliência da nossa sociedade. O nosso crescimento hipocarbónico foi há muito dissociado da utilização dos recursos, marcando o ritmo para uma sociedade global segura e sustentável" (JOUE, 2013).

Em síntese, o desenvolvimento sustentável baseia-se e depende da consecução de objectivos sociais de coesão e equidade social – solidariedade, como refere Andrade (1998) – onde a qualidade de vida e a prosperidade decorrem de um ambiente saudável, promovido por uma protecção ambiental eficaz. Neste quadro, a economia é uma ferramenta (e não um fim em si) de prosperidade e sanidade ambiental e é baseada na eficiência na (re)utilização dos recursos.

Em paralelo, em resposta à crise económica e financeira do final da primeira década deste século, o Conselho Europeu adoptou, em 2010, a Estratégia Europa 2020, uma estratégia a 10 anos para um "crescimento inteligente, sustentável e inclusivo" (Comissão Europeia, 2010). Dois anos depois, adoptou a Estratégia de Crescimento Azul, a "dimensão marítima" da Estratégia Europa 2020, que vê "o crescimento da economia azul" como oferecendo "meios novos e inovadores" para ajudar a UE "a sair da actual crise económica" (Comissão Europeia, 2012, p. 3). De acordo com esta Estratégia, "a economia azul pode contribuir para a competitividade internacional da UE, para a eficiência dos recursos, para a criação de emprego e para a emergência de novas fontes de crescimento, ao mesmo tempo que preserva a biodiversidade, protege o meio marinho e, assim, salvaguarda os serviços oferecidos por ecossistemas marinhos e costeiros saudáveis e resilientes" (ibid.). A Estratégia de Crescimento Azul pretende promover o crescimento de cinco novos sectores-chave da economia azul, nomeadamente as energias renováveis, aquacultura, turismo costeiro, biotecnologia marinha e recursos minerais marinhos, mantendo a aposta noutros quatro sectores "cruciais para o valor e empregos", a saber, construção e reparação naval, transporte marítimo, pescas, exploração de petróleo e gás (Comissão Europeia, 2014). A Estratégia de Crescimento Azul elenca ainda um conjunto de políticas da UE "concebidas de forma a apoiar os esforços dos Estados-Membros e das regiões e a fornecer bases comuns que garantam o êxito da economia azul" (Comissão Europeia, 2012, p. 5), incluindo o

ordenamento do espaço marítimo (entretanto alvo de uma directiva em 2014) e a Directiva-Quadro Estratégia Marinha (DQEM), "que introduz uma abordagem baseada nos ecossistemas [e] visa assegurar que a pressão colectiva das actividades humanas no ambiente seja mantida a níveis compatíveis com a consecução de um bom estado ambiental até 2020." (ibid., p. 6).

Pode uma renovada aposta em crescimento, ainda que azul, contribuir para o desenvolvimento sustentável? Para Jones (2015), através do crescimento azul, a Comissão Europeia parece mais focada na promoção do crescimento da economia marítima europeia do que em restaurar a biodiversidade marinha e em proteger o ambiente marinho. A este propósito, o autor salienta que mesmo a DQEM inclui provisões que permitem aos Estados-Membros identificar casos que permitam a realização de acções "por razões imperiosas de interesse público que prevaleçam sobre o impacto negativo no ambiente" (ibid., p.15). Para Agardy (2016), parece acreditar-se que o bem estar económico surgirá com "a expansão dos usos existentes, o encorajar de novos usos e a maximização do lucro" e que "poderemos preocupar-nos com a biodiversidade e a função dos ecossistemas depois de a economia estar recuperada". A mesma autora questiona-se sobre a forma como as externalidades negativas do crescimento económico são consideradas neste processo e como é que o público é compensado pelos custos decorrentes da expansão dos usos privados (poluição, deplecção de recursos, degradação de valores estéticos, etc.), algo que sintetiza como "privatização dos benefícios, enquanto se tornam públicos os custos".

De facto, num relatório de 2015, a Agência Ambiental Europeia concluiu que o estado dos mares europeus é pobre e que há um conjunto crescente de pressões antropogénicas que o afectam directamente (EEA, 2015). De acordo com este relatório, "todos os serviços dos ecossistemas que podem potencialmente ser fornecidos pelos ecossistemas marinhos nos mares europeus estão ameaçados" e "o efeito cumulativo das pressões e dos impactos estão a reduzir a resiliência do ecossistema, tornando-o mais vulnerável" (ibid., p. 189). Esta degradação "ameaça a auto-renovação do capital dos ecossistemas marinhos nos mares europeus" e "afecta a sua capacidade futura de suportar a crescente economia azul" (ibid.).

No momento em que a Europa olha para o Oceano como fonte de soluções para a crise económica, importa reflectir sobre o teor das políticas marítimas para este espaço vital, nomeadamente no quadro do ordenamento e gestão do espaço marítimo, para assegurar a real sustentabilidade e equidade das opções tomadas. Quais as implicações de uma opção por crescimento ao invés de desenvolvimento azul? Haverá uma diferença real de abordagem ou serão conciliáveis e poderão contribuir de igual forma para um desenvolvimento sustentável?

Portugal configura-se como um caso de estudo particularmente relevante para uma tentativa de resposta a esta questão. Portugal é uma das maiores nações marítimas da União Europeia (UE), tendo soberania ou jurisdição sobre quase metade (48%) das suas águas marinhas (Governo de Portugal, 2014). Com uma área marítima de quase 4 milhões de km^2 (incluindo 1 700 000 km^2 de mar territorial e zona económica exclusiva e 2 150 000 km^2 de plataforma continental estendida), Portugal abarca cerca de 4% da área do Atlântico e 1% do Oceano global (Bessa Pacheco, 2013). O Espaço Marítimo Nacional (EMN), incluindo o leito marinho, é potencialmente rico em recursos vivos e não vivos e há um interesse crescente na sua exploração, principalmente no que diz respeito nos sectores das energias renováveis, includindo energia das ondas e energia eólica, extracção de petróleo, exploração de nódulos polimetálicos e sulfuretos maciços nos fundos marinhos e aquacultura offshore (Ferreira et al., 2015). Desde 2014, Portugal tem vindo a definir todo um novo quadro legal para o "Mar Português" (97% do território nacional), que tem, como objectivo inscrito na Lei de Bases da Política de Ordenamento e de Gestão do EMN, "contribuir para o desenvolvimento sustentável do país" (Diário da República, 2014b, p. 2358). O actual quadro legal, encimado pela Estratégia Nacional para o Mar 2013-2020, espelha as orientações das políticas marítimas desenvolvidas a nível da UE durante a última década, "assenta[ndo] num novo paradigma para o desenvolvimento sustentado, orientado

pela visão da Comissão Europeia para o sector marítimo: o "Crescimento Azul" (Diário da República, 2014a, p. 1317).

Nesta análise pretende-se avaliar em que medida é que as opções adoptadas no quadro legal nacional relativo ao ordenamento e gestão do Espaço Marítimo em Portugal, moldadas pelo modelo do "Crescimento Azul" contribuem para que o Mar Português seja abordado de uma forma socialmente justa e verdadeiramente sustentável.

2. Métodos

O quadro legal nacional relevante para o ordenamento e gestão do espaço marítimo português inclui três elementos principais: a Estratégia Nacional para o Mar 2013-2020 (ENM 2013-2020); a Lei de Bases da Política de Ordenamento e Gestão do Espaço Marítimo Nacional (LBOGEM) e o Decreto-Lei 38/2015, que desenvolve vários aspectos da LBOGEM e transpõe também para o quadro jurídico nacional a Directiva Europeia para o OEM publicada em 2014 (Diário da República, 2015).

Foi efectuada uma análise mais aprofundada do Decreto-Lei, por ser o instrumento que contém os elementos mais concretos referentes à implementação do ordenamento e gestão do Espaço Marítimo Português. Procuraram-se os aspectos potencialmente mais relevantes em termos de equidade social e protecção do meio marinho, para analisar o seu contributo potencial para um desenvolvimento sustentável do mar português.

3. Resultados e discussão

Nesta secção, apresentam-se aspectos contidos no Decreto-Lei 38/2015, de 18 de Março, que desenvolve a Política de Ordenamento e Gestão do Espaço Marítimo Nacional, pertinentes para uma análise da abordagem legal a questões de equidade social e protecção ambiental.

Definição de usos existentes (Art.º 9.º): Embora a LBOGEM articule, expressamente, o objectivo de compatibilidade dos diversos usos e actividades desenvolvidos no EMN, o Decreto-Lei que a desenvolve define "usos e actividades existentes" como "aqueles que estão a ser desenvolvidos ao abrigo de um título de utilização privativa" do EMN (Diário da República, 2015, p. 1527). Com este articulado, o Decreto-Lei exclui do exercício de OEM todas as outras actividades que não requeiram um título de utilização privativa do EMN, como o lazer, nas suas várias vertentes, a navegação ou a pesca. Além de contrariar orientações da Directiva Europeia para o OEM (p. ex., no caso da pesca), esta exclusão não protege a maior parte dos usos existentes não-extractivos, podendo efectivamente contribuir para complicar/dificultar a prossecução do objectivo de compatibilização de actividades e levantando questões de equidade.

Critérios de preferência em caso de conflito de usos ou actividades (Art.º 27.º): O Decreto-Lei define dois critérios de preferência a utilizar em caso de conflito potencial entre usos ou actividades, desde que assegurada a protecção dos valores ambientais: i) maior vantagem social e económica para o país; e ii) máxima coexistência de usos ou actividades. Este último critério só se aplica quando o primeiro não for aplicável ou quando, da avaliação do primeiro, resultar igualdade à luz dos seguintes parâmetros de avaliação: a) nº de postos de trabalho criados; b) qualificação de recursos humanos, c) volume do investimento; d) viabilidade económica do projecto; e) previsão de resultados; f) contributo para o desenvolvimento sustentável; g) criação de valor; h) sinergias esperadas nas actividades conexas; e i) responsabilidade social dos interessados no desenvolvimento do uso ou actividade (Diário da República, 2015, p. 1531). Ao contabilizar postos de trabalho *criados*, qualificação de recursos humanos e volumes de *investimento* (parâmetros *a* a *c*), esta ponderação privilegia actividades novas em relação às actividades existentes que, tipicamente, asseguram a manutenção de empregos e têm baixos valores de investimento (porque já realizados). Tal como acontece com os parâmetros d) e e), respectivamente,

viabilidade económica do projecto e previsão de resultados, trata-se, de qualquer das formas, de previsões de resultados. A experiência internacional sugere que raramente existe uma verificação independente da fiabilidade destas expectativas, que, frequentemente, acabam por ser sobrestimadas, sobretudo em ambientes tão hostis como o ambiente marinho (Ferreira et al., 2015). Os últimos parâmetros são francamente mais subjectivos, dificultando a sua quantificação e comparação efectiva.

Taxa de utilização privativa do EMN (TUEM) (Art.º 75.º e 76.º): O Decreto-Lei cria uma taxa de utilização privativa do EMN (TUEM) que "visa compensar: a) o benefício resultante daquela utilização privativa (...); b) o custo ambiental inerente às actividades susceptíveis de causar impacte significativo no EMN; iii) os custos administrativos resultantes do ordenamento e gestão, da segurança marítima, da manutenção e da fiscalização (Diário da República, 2015, p. 1541). De acordo com o nº. 1 do artigo 76.º que define a "Incidência objectiva" desta taxa, "A TUEM incide sobre todas as utilizações privativas do EMN". Porém, de acordo com o n.º 2 do mesmo artigo, "A TUEM não se aplica à utilização do EMN para a revelação e aproveitamento de recursos geológicos e energéticos" (ibid.). Incluem-se nestas actividades a prospecção e exploração de petróleo e gás e a exploração de minérios no leito marinho, ambas "com enorme potencial de crescimento económico e na criação de emprego, sendo, por isso, consideradas como estratégicas" (Diário da República, 2014a, p. 1320). Tal isenção concedida às actividades potencialmente com maior retorno económico mas, igualmente, com impactes ambientais potencialmente mais significativos, desvirtua o princípio da criação e objectivos da aplicação da TUEM, e reflecte uma desigualdade na abordagem aos diferentes usos e actividades que ocorrem no EMN.

Instrumentos relativos à protecção e preservação do ambiente marinho (Art.º 104.º): Neste artigo, o Decreto-Lei refere-se às Áreas Marinhas Protegidas (AMP) já aprovadas pelos órgãos de governo das Regiões Autónomas, explicitando que serão tidas em consideração no instrumento de planeamento nacional (o Plano de Situação) mas salvaguardando que, "em caso de necessidade, actual ou futura, devidamente fundamentada de salvaguarda do interesse nacional, o Governo pode (...) determinar a não integração, total ou parcial, ou a exclusão [desses] instrumentos" (Diário da República, 2015, p. 1546). Embora aquilo que constitui "interesse nacional" não esteja definido neste Decreto-Lei, a expectativa de retornos económicos da ordem de 60 mil milhões de € anuais resultantes da actividade de mineração marinha no mar dos Açores (Ferreira et al., 2015), uma das actividades consideradas estratégicas na ENM2013-2020, pode condicionar o devir destas AMP.

Os resultados desta análise sugerem que aspectos como a equidade social e uma protecção adequada do ecossistema marinho não estão devidamente salvaguardados no actual quadro legal para o ordenamento e gestão do espaço marítimo nacional, podendo fazer perigar a adequada consecução dos objectivos de sustentabilidade do OEM em Portugal. O quadro legal vigente para o OEM português privilegia o crescimento económico, através da promoção dos novos usos, em detrimento dos usos existentes (que contribuem para a manutenção das comunidades locais e são um factor de resiliência social) e da protecção do meio marinho.

De facto, se, para parte dos países europeus, nomeadamente em torno do Báltico e Mar do Norte, a exploração de petróleo e gás não é já novidade, o mesmo não acontece em Portugal, onde esta actividade se encontra nas primeiras fases de desenvolvimento (Camargo, 2016). O mesmo se passa com as perspectivas de exploração de minérios marinhos no fundo do mar. A este respeito, o relatório da Agência Ambiental Europeia sobre o estado dos mares europeus salienta que "as actividades que usam capital natural marinho não-vivo estão a exercer um conjunto maior de pressões sobre o capital natural vivo do que as actividades que usam este último" e que este facto "gera questões de equidade, uma vez que as actividades que dependem de mares saudáveis, como a pesca, a aquacultura, o turismo e a biotecnologia, podem ter as suas oportunidades de desenvolvimento prejudicadas por aquelas que não dependem directamente de um ecossistema saudável"

(EEA, 2105, p. 189). Especificamente em relação à extracção de recursos minerais marinhos, a UNEP (2012) salienta que se trata de "uma actividade económica finita, frequentemente de curta duração, mas que um desenvolvimento mal conduzido, que não tome em conta impactos sociais e ambientais, pode deixar um legado de problemas e de oportunidades perdidas que se prolonga muito para além do horizonte de consumo dos ganhos desse desenvolvimento" (p. 19). Outro aspecto fundamental a integrar nesta análise é o facto de o meio marinho profundo, dos serviços ecossistémicos que suporta e das suas interrelações ecológicas, serem dos menos conhecidos no planeta (UN, 2016), o que torna fundamental a utilização do princípio da precaução na gestão das actividades que afectam estes sistemas.

Em suma, parece haver uma diferença clara de abordagem entre crescimento e desenvolvimento, nomeadamente no espaço marítimo, sendo que as opções tomadas no quadro do primeiro podem fazer perigar a resiliência social e ambiental necessárias a um desenvolvimento sustentável.

Já em 1991, Brown et al. salientavam que "(...) para a maioria dos economistas e políticos, a expansão ilimitada da economia não apenas parece possível como desejável. Os líderes políticos "vendem" o crescimento como a resposta para o desemprego, pobreza, indústrias em dificuldades, crises fiscais e uma miríade de outras doenças societais. Questionar a sabedoria do crescimento quase soa a blasfémia, de tal forma está impregnada no pensamento popular sobre a forma como o mundo funciona" (ibid., p.94-95). Apesar do reconhecimento de que as acções antropogénicas estão a empurrar o clima global para fora daquilo que se considera ser um ambiente operacional seguro para a humanidade, tendo sido já ultrapassadas várias "fronteiras" planetárias (e.g., Steffen et al., 2015), a constatação de Brown et al (1991) mantém-se hoje tão válida como há 25 anos, provavelmente porque, segundo estes autores, uma mudança real implica ir "ao fulcro dos padrões de consumo individuais" (ibid. p. 96).

No mesmo ano em que a Europa avançava com a Estratégia de Crescimento Azul, um relatório conjunto de organizações não governamentais de ambiente europeias (ESEC, 2012) propôs vias de desenvolvimento alternativas ao crescimento azul. Um dos aspectos propostos foi uma aposta na eficiência na utilização dos recursos e na reciclagem, nomeadamente de minérios, evitando a necessidade de nova mineração, no mar ou em terra, e dos impactos associados, quer na extracção quer na deposição dos resíduos resultantes (cf., a este respeito, Ramirez-Llodra et al., 2015). O mesmo documento salientava também o potencial de criação de emprego nas actividades relacionadas com a economia circular, nomeadamente a reciclagem (ESEC, 2012).

Defende-se assim uma aposta no "desenvolvimento azul", assente numa gestão baseada no ecossistema e nos princípios da precaução e da eficiência na gestão dos recursos e na efectiva participação dos agentes, como meio de promover a equidade social das opções tomadas. Um dos obstáculos a esta participação é a falta de consciencialização dos próprios agentes, nomeadamente daqueles que fazem um uso não-extractivo dos serviços ambientais marinhos (p. ex., em actividades de turismo, fruição e lazer), do seu papel legítimo como actores no processo (Ferreira, 2016).

A avaliação ambiental estratégica (AAE), associada ao ordenamento do espaço marítimo, configura-se como uma ferramenta privilegiada para avaliar e comparar de forma estratégica o leque de opções disponíveis (ESEC, 2012; Ferreira et al., submetido). Para permitir uma visão verdadeiramente estratégica e conducente a um desenvolvimento sustentável, tal AAE requer o desenvolvimento concomitante de uma nova praxis metodológica, um desafio que se coloca à comunidade científica (Noble e Nwanekezie, 2016). Neste quadro, a AAE a realizar, por exemplo, no âmbito da elaboração do futuro plano de ordenamento do espaço marítimo nacional, poderá contribuir para uma visão integrada, holística e sustentável do Mar Português e, por arrastamento, do Mar Europeu.

5. Conclusões

Os resultados da análise de aspectos concretos da política de ordenamento e gestão do espaço marítimo nacional português, apontam para uma opção clara pela via do "crescimento azul", podendo fazer perigar a adequada consecução dos objectivos de resiliência social e ambiental necessárias a um desenvolvimento sustentável do OEM português e de Portugal.

Defende-se, em alternativa, uma aposta no "desenvolvimento azul", assente numa gestão baseada no ecossistema e nos princípios da precaução e da eficiência na gestão dos recursos e na efectiva participação dos agentes, como meio de promover a equidade social das opções tomadas. A avaliação ambiental estratégica a realizar, por exemplo, no âmbito da elaboração do futuro plano de ordenamento do espaço marítimo nacional, poderá contribuir para uma visão integrada, holística e sustentável do Mar Português e, por inerência, do Mar Europeu.

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